

## Technological difficulties: a theoretical frame for understanding the non-relativistic permanence of traditional print literacy in elementary education

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Currently, definitions of ‘science’, ‘reading’, and ‘literacy’ in the US lend a seemingly non-relativistic permanence to these terms, and render them resistant to critique. This paper offers a theoretical frame for critiquing this permanence, analysing why early-literacy instruction is tightly tied to traditional forms of print literacy, focusing primarily on phonics and word-recognition, in an age when new technologies, multi-modal texts, and new literacies flourish. The theoretical framework uses Foucault’s notions of technologies of production, of sign systems, of power, and of the self. Four specific examples of early-literacy programming are analysed in terms of Foucault’s technologies, producing an outline of reasoning about ‘best practices’ in early-literacy instruction in the US. These ways of reasoning are investigated as relative, impermanent, and possibly open to change.

Keywords: elementary education; print literacy; technological difficulties.

For literacy studies, what is needed is something more than the ‘gee whiz’ explanations of new technologies and literacies that spread in scholarly and popular forums, and something more than the simple grafting of theories and practices of print literacy onto the new literacies. ... This requires a broader theoretical framing of the relationship between the residual notions of print literacy and the emergent forms of new literacies. (Luke and Luke 2001: 93)

In a world influenced by technology, children encounter new forms of texts that indicate new ways of reading, writing, interpreting, interacting, and thinking (Burbules and Callister 1996, Kress 1998, Hammerberg [Hassett] 2001). Ontologically, texts have changed (Lankshear and Knobel 2003: 16–17), and they look different from traditional print-based texts where alphabetic letters and printed words are the primary carrier of meaning (Kress 2003). New forms of texts combine visual, verbal, and written elements in ways that rival the printed word (Dresang 1999, Kress 2003, Lankshear and Knobel 2003), indicating that literacy as a school subject might need to be re-conceived (Bearne 2005), because alphabetic print literacy, while remaining ever-important, is no longer enough to meet the demands of new forms of texts and new literacies.

Yet, in the US working definitions of ‘science’, ‘reading’, ‘text’, and ‘literacy’ in much of the research surrounding early-reading curriculum and

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assessment (National Research Council 1998, National Reading Panel 2000) lend a seemingly non-relativistic permanence to alphabetic print literacy within early-literacy programming and policy. By ‘non-relativistic’, I mean that the notions involved in defining literacy as a school subject (e.g. ‘text’, ‘reading’, ‘scientific research’) function in unquestioned ways as ‘givens’ or ‘absolute truths’, as if they can remain permanently unrelated to social, cultural, or technological changes. For example, US federal definitions of ‘reading’ in operation in the Reading First initiative of the *No Child Left Behind Act of 2002* relate effective reading programmes to scientifically-based research derived from traditional printed alphabetic texts (US Department of Education 2002a, b). This understanding of ‘effective reading programmes’ operates as a given, even though the texts that we read and the ways that we think are taking on new forms of representation through new technologies. While ways of reading are dependent upon or inter-connected with other ‘truths’ of this world, such as political, cultural, or technological contingencies, the current educational pre-occupation in the US with printed alphabetic texts makes the use of technology in the classroom dependent on residual notions of traditional print literacy. This non-relativistic primacy of alphabetic print literacy over new texts and new literacies creates a situation where, as Luke and Luke (2001: 93) put it, ‘the simple grafting of theories and practices of print literacy onto the new literacies’ is the norm in education.

In this paper, I will be exploring how it is possible that early-literacy programming maintains traditional print literacy as the primary focus of instruction in an age of multiple literacies and multi-modal forms of communication. In the spirit of Luke and Luke (2001) quoted above, I offer a theoretical framework for analysing the ways in which residual notions of print literacy are continually seen as ‘appropriate’ in early-literacy instruction. The theoretical framework I propose, outlined more specifically in the next section, uses Foucault’s (1988b: 17–18) notion of ‘technologies’, which he described as the different ways that human beings develop knowledge, or the specific techniques that human beings use to understand themselves. The following sections of the paper then apply Foucault’s theory to specific examples of current educational practice in the US, highlighting the ‘technological difficulties’ in early-literacy programming that preclude new forms of texts and new literacies. In the end, I describe how our current reasoning about early-literacy programming is relative and impermanent, and, therefore, possibly open to change. This is a first step, then, toward reconceptualizing literacy in relation to new technologies.

### **Theoretical framework: a matrix of practical reason**

While early-literacy pedagogy may vary from classroom to classroom, and while the theoretical underpinnings behind reading and writing instruction may seem debatable (whole language vs phonics, for example), there is only a certain range of possibilities that depicts what makes something more or less appropriate, more or less reasonable, in the field of literacy education today (Center for the Improvement of Early Reading Achievement 1998,

Learning First Alliance 1998, National Research Council 1998). Beneath the debates, politics, and research in the US about what ‘good’ literacy instruction is, the range of possibilities is contained by a form of systematic reasoning that draws upon particular and static (i.e. non-relativistic) notions of *reading*, *writing*, and *text*. Literacy, as a potentially larger construct, is confined to a specific ‘kind’ in education, held to static understandings of reading and writing as objective skills that can be analysed in the behaviours and heads of children, and texts that involve the linear conventions of an alphabetic writing system. Furthermore, because literacy is seen educationally as a specific ‘kind’ (e.g. reading and writing printed text), there is also a specific way of being literate, or at least becoming literate, in the US elementary classroom through engaging with the symbols and signs in ‘appropriate’ (e.g. developmental) ways. The systematic reasoning that draws upon these understandings of *text*, *reading*, and *writing* forms the rationales, explanations, and objectives for particular pedagogical approaches, and helps to organize and develop knowledge about what might be the most ‘appropriate’ or ‘best’ in early-literacy instruction, no matter if the underlying theory is top-down or bottom-up.

Of course, definitions of *text*, *reading*, *writing*, and *literacy* should not be understood as absolute. One look across the changes that have occurred educationally over time shows how the knowledge used to make decisions about practice is not a matter of ‘given’ knowledge, but of histories, practical techniques, and social forms of reasoning (Graff 1979, 1987, Myers 1996). Yet, in order to rethink early-literacy practices in light of new technologies, it is important first to figure out how current practice is confined to forms of knowledge and reasoning that we take as given, so that we can begin to think about early-literacy education as possibly not-static, and as possibly related to other forms of text, reading, writing, and literate knowledge.

Foucault (1988b) offers a way of understanding how human beings organize and develop knowledge about themselves via four ‘technologies’ that form a matrix of practical reasoning. He also offers a way of seeing this knowledge not as given, but as ‘very specific “truth games” related to specific techniques that human beings use to understand themselves’ (Foucault 1988b: 18). He then names four technologies that function to delineate the knowledge we use as ‘truth’, the knowledge that functions as a ‘truth game’, within a matrix of practical reason:

- *technologies of production*, which permit us to produce, transform, or manipulate things;
- *technologies of sign systems*, which permit us to use signs, meanings, symbols, or signification;
- *technologies of power*, which determine the conduct of individuals and submit them to certain ends or domination, an objectivizing of the subject; and
- *technologies of the self*, which permit individuals to effect by their own means, or with the help of others, operations on their own bodies and souls, thoughts, conduct, and way of being, so as to transform themselves in order to attain happiness, purity, wisdom, perfection, or immortality.

While mainstream educational research, policy, and pedagogy never make explicit use of ‘technologies’ in Foucault’s sense, daily educational work is steeped in an understanding of ‘appropriate’ practice. That daily understanding can be described via a matrix of practical reasoning about the ‘truths’ or ‘facts’ of literacy in education and, in the US at least, depicts what literacy education ‘is’ or involves. Thus, seemingly static constructions of *literacy*, *reading*, *writing*, or *appropriate learner* become open to critique within the frame suggested by Foucault (1988b, 1990a, b) as ‘truth games’ that are related to the specific techniques that permit us to understand the field of literacy education in a specific way (e.g. its modes of production, its sign systems, its power, its literate self).

Foucault’s notion of technology,<sup>1</sup> therefore, involves a sense of technology that is different from the Frankfurt school’s notion of instrumental reason, and also an understanding different from commonplace notions of inventions, accessories, computers, or appendages. Technologies that form a matrix of practical reasoning around ‘literacy’, both in and out of the classroom, are not consciously created as tools to promote a specific ‘vision’ of literacy. They are, instead, functions of *being* in the reasoning as it stands, of making the matrix of reasoning a ‘truth’ rather than a ‘truth game’, of living within the discourses of early-literacy pedagogy.

In the remainder of the analysis, I use each of Foucault’s four technologies as a theoretical lens to analyse four specific examples of current reasoning that appear non-relativistic, permanent, or fundamental in early-literacy programming.<sup>2</sup> I begin with *technologies of power* to analyse how literacy is made objective and static through science and myth by looking at the research and policies surrounding the Reading First Initiative of the *No Child Left Behind Act of 2002* (US Department of Education 2002a, b). Next, I use *technologies of sign systems* to analyse Clay’s (1993, 1998, 2000a) *Concepts about Print* assessment task as an example of the specific set of symbols and signs used in reading at the elementary level. Thirdly, I explore how *technologies of production* permit us to produce only certain types of texts held to certain rules of appropriate practice by looking at the pedagogy of ‘shared writing’ (Routman 1994, Dorn *et al.* 1998). Finally, I use *technologies of the self* to analyse the relationship between the learning environment (Fountas and Pinnell 1996) and the self as an example of how technologies of the self make the system of reasoning about literacy ‘our own’ in the development of a particular kind of ‘appropriate learner’ who is self-regulated and independent, but only toward certain print-based tasks.

Throughout my analysis, I point out what I am terming *technological difficulties* in current reasoning about early-literacy. By ‘technological difficulties’, I mean the places where there are problems, or difficulties, in the reasoning as it stands, especially in relation to new forms of text or new forms of literacies. My hope is that this term, ‘technological difficulties’, will be useful in framing the relationships between traditional print literacy and new literacies, because by pointing out the places where residual notions of print literacy rub up against, or are in contradiction to, new literacies, we can perhaps begin to question our reasoning and re-conceptualize early literacy programming. If Foucault’s theoretical concept of technologies offer a lens for understanding the reasoning we use to organize and develop knowledge

in early-literacy education in the alphabetic ways that we do, then the ‘technological difficulties’ we find in the analysis become useful ways for describing the specific holds that fundamental and non-relativistic notions of print literacy have over the behaviours, mentalities, successes, and failures of young children learning to read in a technological world.

In the conclusion, I step back and look at the matrix of practical reasoning that forms the boundaries of contemporary practice at large. If an empirical question involves asking what teachers can do with new technologies in the classroom, then its answer needs to step outside the current theories and practices of literacy education that are tightly tied to printed alphabetic text. From this analysis, it becomes possible to explore the relationships and disconnections among current print-literacy programmes and the emerging literacies that are possible with new technologies and new forms of text.

### **Technologies of power: the myth and the science of literacy**

Numerous scholars have written about the ‘new’ demands in a technological society: the decline of writing in favour of conceptual complexity, imagination, and multi-media design (Kress 2003); changes in the social relations of work brought about by new technologies (Kalantzis and Cope 1996); a new work-order where *learning* a job is the same thing as *doing* the job, calling for knowledge-workers, as opposed to people who possess a set of pre-defined skills (Gee *et al.* 1996); and cultural and linguistic diversity in communications that will require a pedagogy of multi-literacies (Cope and Kalantzis 2000). Yet, such considerations around the real and rising demands of a technological society are rarely taken up in political and programmatic initiatives and educational policy in (at least) the US. While the need to prevent reading difficulties is often associated with the ‘rising demands of a technological society’ (National Research Council 1998), basic print-literacy skills end up being the ‘answer’ for meeting those demands.

In this section, I use Foucault’s (1977b, 1988b, c, 1990a, b) concept of *technologies of power* to outline the mechanisms that make basic print-literacy our first line of reasoning, even in the face of technological change. In Foucault’s terms, technologies of power ‘determine the conduct of individuals and submit them to certain ends or domination, an objectivizing of the subject’ (Foucault 1988b: 18); but technologies of power, also in Foucault’s sense, are productive. Technologies of power, in the case of literacy, *produce* a sense of literacy as an alphabetic, print-based object, and this static form of literacy comes with a ‘political economy’ of truth that centres on scientific discourses (Foucault 1977b: 131) as well as the myth of print-based literacy as necessary and powerful in and of itself.

#### *The myth of literacy*

As educators, policy-makers, researchers, and politicians reason about appropriate early-literacy instruction, a baseline assumption is ever present: basic print literacy is (assumed to be) necessary and powerful. It is against

this backdrop that we are able to measure what Foucault (1977b: 131) calls a “general politics” of truth: that is, the types of discourse which [a society] accepts and makes function as true’.

The social and cultural ‘truths’ associated with reading and writing today (e.g. traditional print literacy as necessary for a technological society) can be read as a general politics of truth that plays out in particular rules of reasoning within culturally- and historically-specific ‘truth games’. It is a ‘truth game’, as opposed to a ‘truth’, to think of literacy as necessary and powerful because—and this is key—it has been well established historically that there are no direct causal links between literacy and power, literacy and development, literacy and equal opportunity, literacy and tolerance, literacy and success, literacy and whatever (Graff 1979, Street 1984, Gee 1991, Tyner 1998). Although literacy is believed to provide economic and social stability, Graff (1979, 1987) has demonstrated that the grouping of literacy with ‘good’ and illiteracy with ‘bad’ is a ‘literacy myth’ with little historical evidence. Graff (1987: 31) contends that ‘major steps forward in trade, commerce, and even industry took place in some periods and places with remarkably low levels of literacy; conversely, higher levels of literacy have not proved to be stimulants or springboards for “modern” economic developments’.

The current discourse that traditional alphabetic print-literacy is needed for success in a technological society functions as true, then, not necessarily because alphabetic print-literacy, by itself, has technological privileges, but because current understandings of alphabetic print-literacy are invested with a general politics of power and privilege. While print literacy has, in various times and places, been associated with forms of religious, political, and social privileges (Eisenstein 1979, 1986, Clanchy 1983, Pattanayak 1991), we should not mistake those socially-, culturally-, and historically-tied privileges as ongoing truths. For example, being learned in Latin (or knowing how to read and write, for that matter) will no longer exempt you from the death penalty, a privilege for clergy in mediaeval England (Clanchy 1983: 16). And it is not necessarily ‘true’ that cultural productions with widespread influential effects require an alphabet: ‘In the Middle Ages, visual communication was, for the masses, more important than writing’ (Eco 1996: 5). In other words, it is not that certain privileges are always attached to literacy; instead, particular forms of literacy are intertwined with ways of prioritizing, living, reasoning, and being, in such a way that literacy ‘itself’ cannot be yanked out of particular historical and cultural contexts (Gee 1996: 59).

Yet, the literacy myth itself works to produce a situation where literacy *is* yanked out of its particular historical and cultural context, invested with a particular political economy of truth. It is as if basic alphabetic-print literacy, by itself, yields the same powerful effects in any context, technological or not. For example, the political economy of basic print literacy *as* power makes it possible for the National Research Council (1998: 1) to begin the ‘Executive Summary’ of the report of its Committee on the Prevention of Reading Difficulties in Young Children by stating:

Reading is essential to success in our society. The ability to read is highly valued and important for social and economic advancement. ... Current difficulties in reading largely originate from rising demands for literacy, not from declining absolute levels of literacy. In a technological society, the

demands for higher literacy are ever increasing, creating more grievous consequences for those who fall short.

While rising demands for literacy in a technological society involve, as other scholars have noted, new forms of text with non-linear, highly symbolic, visual and verbal elements that require reading beyond the printed word, the Committee on the Prevention of Reading Difficulties cannot make this kind of recommendation because of the hold that the basic print-literacy myth has over contemporary educational reasoning. In fact, the report overall, commissioned by the US Department of Education and the US Department of Health and Human Services, goes on to recommend the prevention of reading difficulties in a technological society through traditional print-based tasks. In the same way, the Reading First Initiative of the US *No Child Left Behind Act of 2002* ends with a list of five essential elements of reading instruction, all of which take traditional print-literacy as the subject matter of early-literacy instruction, despite the rising demands of a technological society, or any changing definitions of adequate literacy.

The very concern over literacy rates and reading difficulties is made possible because of a double political economy: one attached to basic print literacy and the other attached to a technological society. Yet, the basic print-literacy truth wins out, as the short nod to the rising demands of a technological society (with its appeal to contemporary understandings of 'progress') ends with the re-inscription of the print-literacy myth as a way to achieve that progress. Appealing to a 'technological society', then, is an additional use of power as a technology to leverage common desires for the future by drawing on and recycling the already-established. This way of reasoning is simultaneously sheltered by the literacy myth and provides shelter for any appeals that look like 'change' or 'progress'. Despite the rhetoric of progress toward a 'technological society', in other words, the line of progress ends in the classroom—with more of the same.

Literacy, then, or more specifically reading, is constituted as an *object* of thought and study in very particular ways (e.g. print-based), and thought about in a positivistic sense, in that policy, administration, measurements, laws, regulations, and science can take on the problem of preventing reading difficulties as a neutral, objective entity to be analysed. The political economy currently invested in literacy *as* power (warranted or not) becomes a technology of power via mechanisms that re-invest the myth of literacy for economic production and political control.

The over-arching assumption that literacy is necessary and powerful, then, is a 'literacy myth' in the form of a 'truth game' that helps us to reason about appropriate literacy practice. This 'truth game' has political economy. Thus, Gee (1996: 26) points out that the 'literacy myth is, in fact, one of the master myths of our society; it is foundational to how we make sense of reality, though it is not necessarily an accurate reflection of that reality, nor does it necessarily lead to a just, equitable, and humane world'. It is a technology of power that draws upon the 'literacy myth' as a technique to inform our realities, and, humane or not, imagined or real, the types of literacy programmes, goals, assessments, and political conduct that seem 'appropriate' are based on the perceived necessity and power of print literacy. Literacy

is confined to a specific ‘type’ in educational reasoning via social, political and cultural technologies of power.

*The science of literacy*

The power of print literacy, then, becomes a ‘truth’ through myth (e.g. the discourses that take up the power of print-literacy for a technological society), but it is through science (e.g. the scientific discourses that produce a specific definition of what literacy ‘is’) that literacy is made into an object to analyse within the heads of children. Literacy, as a potentially larger construct when embedded in cultural contexts and ways of being, is narrowed to a psychological, individualistic, skills-based activity through technologies of power that limit the field of study to specific measurable outcomes.

Reading First, an initiative of the *No Child Left Behind Act of 2002*, is an example of US legislation that functions as a technology of power as it limits the field of study while simultaneously producing a specific definition of what effective reading instruction ‘is’. The law provides funding from the federal government to states for the teaching of reading, and, therefore, appears as a productive form of power. Its focus is positive and constructive: to ensure that all children receive effective reading instruction in kindergarten through 3<sup>rd</sup> grade. Based on the findings of the National Reading Panel (2000), which examined years of scientific research in reading, Reading First strives to eliminate reading problems by providing professional development for teachers around five common elements of effective reading instruction: (1) phonemic awareness; (2) phonics; (3) vocabulary development; (4) reading fluency and oral reading skills; and (5) reading comprehension strategies (National Research Council 1998, 1999, National Reading Panel 2000, 2001).

It is important to note that these five elements, while indeed essential under current print-based understandings of early-reading instruction, are defined by the National Reading Panel (2000) and the US Department of Education (2002b) in quite specific ways. For example, within the domain of vocabulary development, the National Reading Panel makes a distinction between listening, speaking, reading, and writing vocabularies. This distinction is significant because it supposes that there is only a certain bank of words for reading or speaking, writing or listening, as opposed to an understanding that children can, with good teacher support, read, hear, and write high-level vocabulary. This precludes the use of materials with ‘advanced’ vocabulary, whether or not the children understand the meanings of the words when listening or speaking, thus controlling a sense of developmental levelling. In addition, fluency is defined as the ability to read text accurately and quickly, and, here again, decodable and levelled texts are thought to be helpful in teaching quick word recognition. Lastly, while Reading First includes comprehension strategies as a core element of early-reading instruction, comprehension is construed as the comprehension of the limited reading vocabulary—as opposed to challenges or substance in the materials children read. Comprehension of limited and decodable reading

vocabulary is characterized in Reading First as a way to ‘support’ children’s reading. In this way, Reading First operates a technology of power that works to determine the types of challenges, materials, words, and conduct that can be expected within the domain of a reading lesson.

It should also be noted that these five elements can be taught in a number of ways using a variety of different approaches, lessons, and materials. However, while the Reading First initiative maintains that there are no ‘sanctioned’ programmes that must be used in order for states to receive funding, the flexibility of states in receiving and administering the funds revolves around whether the programmes chosen are based upon ‘scientifically-based’ reading research.<sup>3</sup> This limits reading programmes and research to methods that can be measured experimentally, and excludes a large body of research, conducted by, among others, reading researchers, linguists, and anthropologists, because their research is not deemed ‘scientific’ (Berlak 2003: 11–12).

Reading First, thus, operates as a technology of power by making literacy ‘objective’ and quantifiable through curricular goals, measurable outcomes, and sequenced lessons. By demanding only certain forms of ‘truths’ about reading, Reading First functions as a technology of power as much for economic motives as for political control. As an object, literacy is produced, studied, and consumed under tight control, as the sensibilities and dominance of ‘literacy-as-scientific’ submit teachers and students in classrooms to specific curricular ends and not others.

In sum, technologies of power define print-literacy in ahistorical, seemingly permanent, objective, static, and non-relativistic ways, thus determining the conduct of individuals toward particular curricular ends. However, there are at least three ‘technological difficulties’ (i.e. places where there are problems in the reasoning as it stands *vis-à-vis* technology) with defining literacy as objective and static via either myth or science. First, non-relativistic definitions of literacy pull ways of being literate out of social and cultural contexts, which defines literacy as a ‘certain thing’, without care for new texts, new literacies, new contexts, new purposes, or new times. Secondly, the reliance on measurable outcomes and decodable texts maintains literacy in its static print-based form, which precludes the use of other forms of text for early-reading instruction. And, thirdly, the objectification of literacy via the ‘truth game’ of science precludes other forms of research, which makes ‘the possibility of constituting a new politics of truth’ (Foucault 1977b: 133) difficult to imagine, much less establish.

### **Technologies of sign systems: alphabetic print concepts as the focus of ‘natural’ learning**

The possibility for developing a new politics of truth regarding literacy and technology may begin, in many ways, by expanding the notion of ‘what counts’ in the sign systems of literacy. Currently, early-literacy instruction in the US involves one particular sign system over all others: the writing system of alphabetic English, which represents the sequences of phonemes in words

through written symbols or letters (i.e. graphemes). This system also uses logographs, such as numbers, and other symbols that convey how something is to be read, such as punctuation marks (see, e.g. Pérez's (1998: 53–58) discussion of writing systems).

However, in an ontological sense, contemporary texts have changed (Lankshear and Knobel 2003: 16–17), and look different from traditional print-based texts where graphemes are the primary carrier of meaning. In part a product of new technologies, such as photo-mechanical printing technologies or digital technologies that allow combinations of sound, texts, and images, texts today contain signs and symbols outside of the writing system of alphabetic English, signs that carry meaning beyond the printed word (Kress 1998, Dresang 1999, Hammerberg [Hassett] 2001). For example, the graphics used in the contemporary children's book, *Meanwhile* (Feiffer 1997) make some of the words appear as 'yells' by the megaphone-shaped placement and colour of the words on the page. There is no need for commas or quotation marks to know that 'mom' is yelling: the graphics themselves indicate a level of meaning beyond alphabetic English. As another example, the dedication page to *The Stinky Cheese Man* (Scieszka and Smith 1992) is written in huge block print upside-down, inviting the reader to turn the book around as opposed to thinking the book is printed 'incorrectly'. While both of these examples appear in actual books with actual pages, the extra level of meaning via the ontological shift in 'text' is something currently outside of early-literacy programming (Hassett 2006).

Foucault (1988b: 18) refers to *technologies of sign systems* as those 'which permit us to use signs, meanings, symbols, or signification'. Given that each of Foucault's four technologies is associated with a certain type of domination, technologies of sign systems in early elementary education can be thought of as governing the general subject matter as well as the 'appropriate' focus of early-literacy programming. In the US, the reason of pedagogical practice in early-literacy education is based almost entirely on the sign system of alphabetic print in such a way that the focus of 'natural' reading development is tied to print concepts to the exclusion of other types of signs and symbols. In the next section, I demonstrate how current reasoning about appropriate literacy instruction ties 'natural' learning to the sign system of alphabet English, and I outline the 'technological difficulties' inherent in such reasoning.

### *The focus of literacy*

Because, in part, of the myth and science surrounding literacy, which makes typographic texts the primary 'material' of early-literacy programming, educational research in literacy has outlined and focused on the concepts that children need to learn about print in school, and also before they come to school. The educational goal is to prevent reading difficulties before they start, with an emphasis on the belief that the 'foundation for reading success is formed long before a child reaches first grade' (Learning First Alliance 1998: 10). Basic knowledge about print is considered important because an

early awareness of print concepts is seen a pre-cursor to success in reading later (Johns 1980). This basic knowledge includes book orientation, print direction, and letter-word concepts (Johns 1980, Clay 1998). Thus, 'success' in early-reading is established through a technology of sign systems that structures how one is to assign meaning to an alphabetic writing system in order to be seen as potentially literate.

Because early concepts about print are presently attached to later success in reading, kindergarten and 1<sup>st</sup>-grade teachers are often required to find out what their students know about print concepts. Thus, Clay (1993, 1998, 2000a), an educational psychologist, has developed a 'Concepts about Print' (C.A.P.) task that checks what children know about the way we print language:

some of the important concepts that can be tested easily are: the front of the book, that print (not the picture) tells the story, that there are letters, and clusters of letters called words, that there are first letters and last letters in words, that you can choose upper or lower case letters, that spaces are there for a reason, and that different punctuation marks have meanings (full-stop, question mark, talking marks). (Clay 1993: 47)

These concepts, easily tested through the C.A.P., are the same concepts that dominate early-elementary literacy education as technologies of sign systems train and modify young students toward observable tasks.

The C.A.P. task itself consists of little booklets that are read to a child while he or she 'help[s] the examiner by pointing to certain features as the examiner reads the book' (Clay 1993: 47). The student points to text features such as the front of the book, what to read on the page (the print, not the picture), or where to start reading on a line (directionality). The little books of the C.A.P. also contain inverted pictures, inverted words, misordered line sequences, and misordered letter sequences within words. The examiner has a series of questions to ask the student (e.g. point out where to start or which direction to go), and on pages where something is 'wrong' (e.g. upside down), the examiner reads the text as if everything was correct and asks the student what's wrong on the page.<sup>4</sup>

In Clay's (1998: 110) own description of the C.A.P. task, the 'systematic observation of young children's progress' is governed by the extent to which the alphabetic sign system is used and recognized as right or wrong. For example, when Clay writes that it is important for teachers 'to be systematic about locating children who [are] making much slower progress with literacy learning than their classmates', the 'slowly-progressing' students are defined by the (in)appropriate use of an alphabetic sign system. The 'slower progress' of these students is compared against 'their faster-learning classmates' in a way that assumes that students need to learn certain concepts of print at certain times. If they don't, there is the fabrication of a '6-year-old (safety) net' to assist in their developmental progress (p. 110). The rate of progress, then, is instrumentally measured through a technology of sign systems (i.e. which aspects of print students know about and focus on). In the end, educational reasoning about success, progress, and appropriate focus for young learners is governed by and tied to the alphabetic writing system.

*Natural and appropriate learning*

The fact that it is viewed as educationally 'important' for teachers to 'locate' children who are making 'slow progress' indicates the extent to which sign systems regulate what 'appropriate progress' looks like, and govern what we think of as 'natural' learning. The C.A.P. task is based on a 1963 research project where Clay (1998: 110) devised some observable tasks to assess 5-year-old children who were reading books 'naturally'. Here, 'natural' learning is attached to a particular material product: books, at the time written in 1963 but with textual features that are with us today.<sup>5</sup> In addition, whether or not the reading is 'natural', the observable behaviours are not necessarily focused on the content or message of the book; they are organized around particular book structures (left-to-right, top-to-bottom, front-and-back). Finally, in assessing that which comes 'naturally' (to some), the actual assessment device takes all semblance of 'natural reading' out. The printed language is almost completely estranged from the symbols that are supposed to represent it. With their up-side-down backwardness to assess right-side-up forwardness, the symbols used in this task are not meant to be a medium for plot. Instead, they are meant to be a medium for assessing a child's understanding of a very small aspect of reading: how alphabetic signs and symbols work, not to create meaning, but to create a structure that we call 'text'.

Early-reading concepts that are easily tested and occur 'naturally' (with books) are based on what successful readers know long before kindergarten. Yet, as a technology, the knowledge of sign systems is consumed as an assessment device with 'unsuccessful' new readers. They are not doing 'naturally' what their 'successful' counterparts have been given in culturally-driven home experiences that closely match school-based experiences with sign systems.

The rules and order of alphabetic print, then, also govern the appropriate desires and attitudes of individuals themselves. A certain way of valuing, liking, and using print is attached to the sign system. Those students who do not have the 'appropriate' (i.e. 'print-rich') home life, or 'a love of books', are seen as 'at risk' of falling behind their classmates (National Research Council 1998), and then monitored via the same technology of sign systems that was 'missing'.

In sum, technologies of sign systems organize the system of reasoning about literacy instruction and appropriate literate behaviour around alphabetic English and the print-based characteristics of traditional text. Yet, it is what I am terming a 'technological difficulty' in the reasoning as it stands to focus exclusively on an alphabetic sign system as the primary carrier of meaning when we consider the multiple ways in which meaning is represented in new forms of text (upside-down, backwards, in images, and in graphics). It is an additional 'technological difficulty' in light of new technologies and new texts to make the awareness of particular print concepts a matter of 'natural' learning. Success, progress, and appropriate mentalities attached to sign systems are signs of *this* time. Historically, different sign systems (with spaces, without spaces, with marginal art, without meaning to be 'found') have played their parts in governing habits of reading and writing, including cognitive skills (Saenger 1997), and new forms of text will do the same.

### **Technologies of production: early-writing pedagogy and the author-function**

To move outside of the printed page and consider the significance of new technologies and new texts in the classroom, the pedagogy that produces only certain forms of texts, and only certain ways of governing the reading and writing habits of young literacy-learners needs to be closely scrutinized. This section considers the ways in which early-writing pedagogy is a technology of production in the making of a particular kind of text and, as a result, the formation of a particular function for a young author. Foucault (1988b: 18) refers to *technologies of production* as those 'which permit us to produce, transform, or manipulate things'. As we teach students to transform and manipulate their thoughts into writing, we are engaging in a technology of production that trains young authors, teaching them how to produce specific texts and function with the tools and technologies at hand.

#### *Early-writing pedagogy: modelling the process, formalizing text*

Research in early-writing instruction advocates the inclusion of four types of writing experiences throughout the day: shared writing; interactive writing; guided writing or the writing workshop; and independent writing (Calkins 1994, Atwell 1998, McCarrier *et al.* 1999). Taken together, these practices of writing instruction provide students with ways to see the writing process in action so that they can learn how to write their own pieces independently. In this section, I focus on shared writing because of its educational impact in providing a model for writing on which students rely as they become independent writers. While other forms of writing instruction theoretically 'allow' students to explore their own voices and topics, shared writing functions to demonstrate the standards of writing, and sets the norm for appropriate topics and textual forms. It is a training in how to be and think like a writer, how to produce a coherent text (Dorn *et al.* 1998: 64; see also Routman 1994).

During shared-writing time, the teacher stands or sits in front of the class, writing on a chart tablet or a computer with a projector so that everybody can see the demonstration of how writing works. The students listen to the teacher think out loud about the choices he or she is making to produce a text, as a function of modelling how sounds and words can be transformed and manipulated into a printed text. In such modelling, teachers can choose which features of writing to focus on: appropriate spelling; supporting the main idea with appropriate details; creating a voice appropriate to the audience; choosing words that describe just-so; how to use quotation marks; and so forth.

While the possibilities for teaching within shared writing may seem endless, they are bound by traditional expectations for the look and feel of a written text, computer-generated or not. The layout is visual: the process of representing sounds in words, and the spaces between them, takes place on a surface to be seen by all. The stories or sentences are linear; the reader

reads them line-by-line, guided by the class, the teacher, and the pointer highlighting words. Even as the meaningful, coherent message appears to be the primary educational focus, the end-product achieved through shared writing is a text that has specific print-based characteristics.

Shared writing is also bound by particular social and political constraints about what can be said or written in the classroom. As teachers model the shift from oral to written language, dialect and authentic language are worked over in the technological production of a written piece that conforms to formal and written grammatical structures and conventional subject matters. For example, the subject matter of shared writing is contained by shared and common experiences in the classroom: class observations, rules and charts, newsletters, or curricular studies (Routman 1994: 60). The narratives written aloud are personal, but harmless (if not wholesome): descriptions of people or places; definitions of noble themes; or 'how-to' explanations (see the writing topic examples in Kemper *et al.* 1995: 29). Possible writing topics, while seemingly boundless, are managed by a technology of production that filters many voices into a planned and systematic product, and suppresses the multiple levels of meaning available in complex or controversial themes.

As a technology of production, then, shared writing works to produce a text that, while negotiated among multiple voices sitting together, appears written from a singular perspective (i.e. there are not multiple levels of texts and contradictory voices describing multiple perspectives). Controversy is transformed into appropriate resolution; characterization and perspective appear whole and complete; and subject matter is channelled accordingly. The variety of responses from a large group of authors-in-training become negotiated into sentences and texts that represent a synthesized, conglomerated author functioning as a single voice out of many. In other words, textual formalization involves more than the conventions of print, and includes ways of transforming and manipulating thought and language via a technology of production embedded in an early-writing pedagogy.

Thus, there might be room for hypertext, or graphics representing meaning beyond words, as is common in contemporary children's literature (Dresang 1999, Hammerberg [Hassett] 2001). *We could* make the text look like anything as we model what it means to be an author. However, as a pedagogy, shared writing produces texts and authors who follow the conventions of print and a process of writing a traditional text, but with limits on what a final meaningful, coherent message might look like. In short, to grapple with what new technologies or new materials might mean in the classroom, we need to analyse pedagogies and their productions for the messages they send to students about the types of texts that can be produced, and the types of texts that are valued.

### *The author function*

In textual production, the manner in which discourse is articulated is a function of the author, and the function of the author changes over time, discourses, and cultures. For Foucault (1977a: 137), the 'author-function'

is not necessarily about what the author is saying in terms of themes and concepts, but more a matter of how the author is able to express specific themes and concepts on the basis of social relationships within the 'mode of existence' of discourse. In other words, it is not as if a singular author is 'in control' of what gets written. Authors, young or old, function within the limits, exclusions, possible choices, and so forth—as defined by particular rules of reasoning about textual production, including how to use the features of the medium employed. The author, thus, functions according to the rules of reasoning that are embedded within specific techniques used to produce texts (i.e. technologies of production).

Whether the writing tools available involve pencil and paper or word-processing, the pedagogies and writing techniques in place within current reasoning about early literacy shape a specific function for the author in the production of a certain type of text. It is not as if the author precedes the technologies that bind her; she is a function of those technologies, working within the limits, exclusions, and possible choices for producing 'text'. Both the pedagogical and material tools needed to produce a text, as well as the culturally and historically specific notions of what a text 'is', work as technologies of production to train young authors to define 'text' and the messages it might represent. A young author might be able to produce a variety of 'things' with a pencil and a piece of paper. However, what the author is able to 'say' and 'do' with that pencil and paper in terms of becoming an 'appropriate' writer is a matter of the tools and textual structures embedded in a pedagogy.

Thus, the function of the author is closely tied to the technology that produces a particular kind of writing experience and a particular kind of product. In the educational production of an author, as seen in the case of shared writing, the product takes an expected form from a single perspective, with specific boundaries on subject matter, character, and resolution. Assumptions about what a text 'should' look like drive how a text 'should' be written; in other words, there are limits to the ways that thoughts may be represented. Young students learn to internalize the lessons learned through shared writing so that their own independent writing can take on similar characteristics. Texts are assumed to be whole, static, and final, and the author functions to make it so. The pedagogy becomes the author through technologies of production that permit us to produce, transform, and manipulate text in particular ways.

As technologies of production permit us to produce only particular types of texts held to particular rules of appropriate practice, they function in whole and static ways in the classroom, causing educational reasoning about appropriate writing instruction to remain tightly tied to the characteristics of alphabetically-printed text. The 'technological difficulty' implicit in this reasoning, especially as it rubs up against new technologies, emerges from changing notions of text, readership, and authorship. Historically, the representation of ideas and the format of texts have varied over time and across cultures. The continuous scripting without spaces of the ancient Mediterranean world (Saenger 1997), the images in the margins of mediaeval texts (Camille 1992), the penmanship exercises of the early 1800s (Myers 1996: 49–53), or the icons of links in a hypertext (Landow 1992) all require different technologies of production, and different functions for the author.

An example: contemporary children's literature often produces the need for an interactive writer/reader through the form, style, graphics, and meaning beyond words (Dresang 1999). Such interactions make it possible for multiple perspectives, multiple story-lines, and multiple choices to be displayed within the same book. It is a different technology of production to be a writer within such forms, which calls for a different pedagogy based on approaches to teaching and author-functions that permit conceptual design, multiple voices, non-linear plots, deep characterization, and/or meaning beyond typographic denotation. However, contemporary early-writing instruction in the US holds 'text' to an expected form, seen from a single perspective, and with specific boundaries on language, subject matter, character, and resolution. The author, as a function of the technology, is trained accordingly.

### **Technologies of the self: becoming independently literate in the learning environment**

In the previous sections, I explored the systems of reasoning that make a particular classroom framing for reading and writing reasonable, somewhat at the expense of considering the individuals who practise the rules of reading and writing on a daily basis. Yet, the implicit and explicit ways of reasoning about the power and necessity of print literacy, the developmental progress of alphabetic-print recognition, and the production of young authors' texts have significant impact on everyday individuality in the classroom. Because each technology 'implies certain modes of training and modification of individuals, not only in the obvious sense of acquiring certain skills but also in the sense of acquiring certain attitudes' (Foucault 1988b: 18), the everyday individuality of everybody in the classroom is touched to the core by all of the technologies that define reasoning around 'best' and 'basic' literacy practices. In other words, the social and historical uses of technologies are made 'our own' through *technologies of the self*.

Foucault (1988b: 18) refers to technologies of the self as technologies

which permit individuals to effect by their own means or with the help of others a certain number of operations on their own bodies and souls, thoughts, conduct, and way of being, so as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection, or immortality.

In contemporary US classrooms, the formation of individuality is a matter of acting upon oneself within the matrix of practical reasoning that is already in place. This section explores the ways in which the larger matrix of practical reasoning about appropriate literacy practice is internalized and scrutinized at the level of the individual self.

#### *The necessity and training of independence*

Today, being a literacy-learner in the classroom requires that children operate on their own thoughts and conduct while the teacher is busy working

with other children in small groups to meet individual needs (Holdaway 1979, Fountas and Pinnell 1996). This means that technologies of the self are a necessary part of early-literacy programming so that children can function in self-regulated ways on pre-defined early-literacy tasks (Hammerberg [Hassett] 2004).

Part of a student's task in managing his or her own behaviour involves knowing what to do and when, a particular self-knowledge that is learned and internalized by way of the teacher's explanations of 'how to know what to do by yourself'. The techniques that individuals use to be self-regulated come about 'with the help of others' (Foucault 1988b: 18), specifically through the guidance and management strategies of teachers. Such self-management occurs by way of classroom management, and the organization of the classroom as a 'learning environment' (Hammerberg [Hassett] 2004).

The technology of self-management, within a classroom designed as a 'learning environment', involves more than the ability to be happily quiet, and more than the inclination to be engaged in just anything. The self that functions successfully in the contemporary US elementary classroom—to achieve a certain state of happiness, wisdom, or perfection, in Foucault's terms—must function in ways consistent with the overall goals of basic literacy instruction. Thus, for Fountas and Pinnell (1996: 53), as for others, it is important that the class is 'engaged in meaningful literacy' while the teacher is with a small group, as opposed to engaged in 'busy work like colouring or fill-in-the-blank worksheets'. Knowing how to be busy, but not with busy-work, is a function of the teacher's planning in the creation of a 'non-busywork' environment.

Independent book-reading is considered meaningful non-busywork, but the 'independent' choice is set up to permit an individual to select materials that are 'most appropriate' and not *too* challenging (lest the teacher be disturbed): levelled books stored in levelled bins, familiar stories already known through shared reading, or the products of shared writing. 'As children become more proficient as readers, teachers often require them to keep a list of books they've read independently' (Fountas and Pinnell 1996: 60). This is a formalized way of acting on the self, although the self is acting in a way that is described as 'independent'. The techniques that individuals use to keep track of the books they have read, pick the right levelled bin, or move to listening at the listening centre are part of the teachers' preparation in setting up meaningful literacy tasks and encouraging self-regulation.

The decision to be self-regulated toward meaningful literacy tasks and high academic engagement, then, is not necessarily made by students, but instead by the teacher, as the one who lays out expectations for students to be self-regulated through classroom management and organization. As students exercise technologies of the self over their own thoughts and conduct, they do so in the context of the teacher's techniques of 'knowing' what is best in terms of 'meaningful literacy'. Yet, the teacher herself 'knows meaningful literacy' only within the context of the reasoning as it stands. With her head in the matrix (technologies of power, technologies of sign systems ...), she is thinking of print!

*The learning environment*

In order for students to effect, by their own means (via technologies of the self), an independent work-ethic, teachers are encouraged to provide a classroom environment that is organized for literacy learning and ‘invites children to use print in purposeful ways’ (Fountas and Pinnell 1996: 43). Classrooms organized as invitations for literacy are ‘print-rich’, with materials for reading and writing incorporated ‘naturally’ throughout the room (Cox 1999). Such a learning environment, by virtue of being ‘loaded’ with ‘meaningful’ print, is designed to effect a way of being a ‘good literacy learner’ who is surrounded by the riches of ‘print-things’. The learning environment, then, becomes a pre-cursor to the technologies an individual uses to effect a self who is learning to be literate within that environment.

Within the pedagogical backdrop of the learning environment there are also contextualized particular expectations for how the environment itself *should* lead to particular effects of learning (e.g. levelled book boxes *should* lead to students finding developmentally-appropriate materials). The learning environment itself becomes a directive for how to act upon oneself. In Fountas and Pinnell’s (1996: 44) words: ‘The classroom is organized for independence. The goal is for students to become self-managed learners who can take over the process for themselves’. If routines are explained and children are invited, then the organization of the classroom is secondary to the independent learning that is to occur within it.

At this point, however, the organization of an academically-engaging print-rich learning environment becomes transferred to the ability of an individual to manage herself. How an individual engages with specific tasks becomes a matter of *her* motivation, *his* attitude toward learning, ‘*that one’s*’ ability to be self-regulated, ‘*this one’s*’ need for self-control. Classroom management, as a trait of effective teachers with few disciplinary encounters, is transferred from the organization of the room and the establishment of routines to particular students’ motivations, attitudes, and behaviours.

Two senses of management—the establishment of routines in a structured environment and the management of personalities within that environment (Popkewitz 1998: 66)—often go hand in hand under contemporary belief systems in the US about classrooms as learning environments: individuality is a matter of motivation and attitude toward the learning activities. If the learning environment and the training have been done ‘correctly’, the individual functions in self-motivated and self-regulated ways—with high self-esteem and a sense of self-worth for jobs well done. If an individual is *not* using the well-appointed, print-rich classroom in the intended ways, it is not a problem of the classroom, not a problem of the pedagogy, not a problem of the curriculum content, not a problem of the training, *but a problem of the individual*. Given that the classroom and routines are structured in such a way that students are to feel secure, happy, and motivated, then, from the beginning of the school year on, the expectation is that students will be enthusiastic about being an individual who is learning in the classroom. Those who aren’t have ‘problems’!

In other words, contemporary reasoning about ‘appropriate instruction’ attaches early-literacy learning to appropriate self-conduct. While conducting

themselves independently, accept the curriculum and the training, effecting by their own means operations on their own thoughts, conduct, and ways of being that are in line with an overall system of governance and regulation—all as defined by a system of reasoning that names appropriate literacy instruction. Technologies of the self, in other words, are not of the self *per se*, but instead are practised *within* the larger matrix of practical reasoning.

This becomes a ‘technological difficulty’ when the techniques used to govern oneself are internalized in such a way that they are described as a part of the self as opposed to part of the system and the ‘truth games’ at play in a matrix of practical reasoning. Although ways of being a learner in the learning environment are demonstrated and taught directly, how a student ‘is’ in the environment is not seen as an effect of the system, but instead a result of the student’s inner self.

### **Technological difficulties: making the reasoning relative and impermanent**

Although I have discussed each of Foucault’s four technologies separately for analytic purposes, it is difficult to imagine any one technology functioning on its ‘own’ in educational situations. While each technology is associated with a certain type of governance over ways of reasoning, ‘these four types of technologies hardly ever function separately’ (Foucault 1988b: 18). For example, technologies of power, which operate on the idea of print literacy as necessary for progress, determine the conduct of individuals in the classroom based on the ‘truth-game’ of print. This effectively links technologies of power to technologies of sign systems, production, and the self as individuals are submitted to the particular ends, products, and sign systems of early-literacy instruction. Likewise, technologies of sign systems are intimately linked to individual enjoyment and personal sensitivities, including the products that bring ‘happiness’ as literacy learners. ‘Unhappy’ students, who may not *like* reading or may not partake in book-browsing, are classified as developmentally delayed (Clay 1998: 115). And if self-expression through writing is not necessarily *of* the author but, instead, a function of particular textual formats, conventions, and pedagogies within the matrix of reasoning, this effectively links technologies of production to the ways an individual might show herself or himself as creative, knowledgeable, or self-expressive—as governed by the function of the author within the sign systems and power of print.

I have borrowed Foucault’s four technologies as a theoretical starting point to outline the realm of possibilities in literacy education today, with the hopes of sketching a picture of what ‘best’ and ‘basic’ literacy instruction in the US is all about, in all of its seemingly non-relativistic permanence. As a matrix of practical reasoning about print literacy, this picture frames the limits of a contemporary practice. Yet, the picture of ‘best’ and ‘basic’ practice is only a snapshot, a picture of the present, inert if not constraining.

Today, it is a dead end to think that the literacy matrix as it stands (i.e. education in print literacy alone) can shape how we might meet the particular social, political, economic, and ideological circumstances of a

'technological society'. Getting along well in a technological society will mean being able to decipher the sign systems of print, but it will also mean more. Beyond print, a 'technological society' embraces a wide range of visual and verbal media (Kress 1998), along with the need for critical and interactive reading and readers (Myers 1996: 57, Tyner 1998: 200). While the print literacy matrix as it stands is leveraged as 'the answer' needed to meet the demands of a technological society, education in literacy has changed before, and will change again.

My hope is that the theoretical frame I have been exploring, based on Foucault's four technologies, can be a useful tool to understand what I have been calling 'technological difficulties', or 'weak points', inherent in seemingly non-relativistic and static literacy programming. Foucault's 'technologies' makes it possible to understand how knowledge about good (or best) practice in literacy education is developed in terms of the power of an alphabetic literacy, and why residual notions of print literacy continually appear, and re-appear, as fundamental, despite new forms of literacies and ways of making meaning. Perhaps from within 'the inertias and constraints of the present time', we might locate the 'weak points' (Foucault 1988c: 124) in the matrix of reasoning in order to outline possibilities for change.

To think outside of the matrix of reasoning about contemporary early-literacy instruction means seeing current reasoning about 'basic' and 'best' literacy instruction as problematic. We can do this by thinking about the places in the print-literacy matrix that rub up against new forms of emerging literacies and new forms of text. This does not mean that we need to abandon books or go 'back' to a different standard of literacy; indeed, print literacy remains an important part of new literacies and new texts. Rather, it means that we try to become more aware of the ways in which 20<sup>th</sup>-century understandings of print literacy *preclude* new forms of literacies and new ways of making meaning.

Throughout this analysis, I have highlighted a few of the 'technological difficulties' inherent in current reasoning that preclude new forms of literacies from being taken seriously in early-elementary classrooms and literacy programming, at least in the US. In order to move past the 'gee-whiz' explanations of new technologies and literacies (Luke and Luke 2001: 93), theories and practices of literacy education, which are tightly tied to printed alphabetic texts, need to be questioned vis-à-vis new technological literacies. As a beginning, I would like to suggest ways we might reconceptualize early-literacy programming according to the 'technological difficulties' that we have been exploring.

First, social, political, and cultural *technologies of power* operate on mythic, and seemingly scientific, 'truth-games' to produce a specific definition of what literacy 'is', and to confine literacy to a specific 'type'—at the expense of new literacies and new texts. Knowing this, we need to rethink non-relativistic, static and ahistorical, definitions of literacy, and instead reshape literacy according to an appropriate historical and social context. We need to care about the new texts and the new contexts for making meaning as we think about early-literacy education. The over-reliance on decodable texts and measurable outcomes must make way for a new 'politics of truth', which includes forms of research that view 'literacy' as social and

cultural, ‘text’ as dominated by image and multi-modality, and ‘outcomes’ as multiple interpretations and productions.

Secondly, *technologies of sign systems* currently tie educational reasoning about success, progress, appropriate mentalities, and ‘natural’ learning to the alphabetic writing system. However, texts have changed in an ontological sense, and they look different from the texts currently used in reading instruction. Knowing this, we need to expand the types of sign systems included in early-reading instruction, and acknowledge that *interpretation* of a text may not only be about co-ordinating printed cueing systems. We need to move toward instruction in graphics, imagery, and meaning beyond denotation.

Thirdly, texts are produced through pedagogical training in how to function as an author with the tools at hand via *technologies of production*. Techniques of textual formalization are learned through pedagogical approaches—no matter which material tools are used—and the author learns to function accordingly. Knowing this, we need to pay attention to the pedagogy *before* we move to consideration of materials or technologies. Otherwise, we risk placing expected textual forms, single perspectives, and the absence of authentic or complex topics into pseudo-hypertext form, as when traditional alphabetic worksheets merely move to the computer screen for educational purposes. Instruction in reading and writing new forms of text need not disregard or marginalize the multiple perspectives that exist in every school and every classroom, especially considering the possibilities available with hypertextual and interactive forms of communication.

Fourthly, *technologies of the self* are the mechanisms that individuals use to operate on their own thoughts, souls, and ways of being ‘literacy-learners’, a way of internalizing the matrix of practical reasoning as it stands. Knowing this, we need to pay close attention to the ways in which educational reasoning is internalized and made ‘our own’—no matter what the technology is. As any new technology is used in the classroom, then, we need be aware of the ways in which technologies become a part of us, a part of our very being, and avoid the tendency to make the individual deficient when the system of reasoning around the technology may be flawed.

In sum, the ‘relationship between residual notions of print literacy and emergent forms of new literacies’ (Luke and Luke 2001: 93) can be found by analysing the ‘truth games’ in early literacy, including the flaws and technological difficulties in our current systems of reasoning. The limits and boundaries of contemporary practice in early reading may appear as static or absolute. However, this seemingly non-relativistic permanence of traditional print literacy can be challenged through a new politics of truth, which acknowledges that reading strategies, cueing systems, concepts about print, writing processes, and systems of reasoning in general did not transcend from above, but are instead historical, cultural, and interminably technologized.

## Notes

1. While Foucault (1988b; see also 1988a: 146, 1990b: 11) switches between using the term ‘techniques’ and ‘technologies’ in his essay ‘Technologies of the self’, I use the term

'technologies' to explicate how ways of understanding literacy instruction extend beyond a handful of 'techniques' within literacy pedagogy. 'Technologies' suggests a manner of training and a sense of power, which helps to explain the seemingly non-relativistic permanence that basic print literacy holds over other forms of literacies or other ways of making meaning. Foucault (1988b: 18) echoes this sentiment by indicating that the four major types of technologies are each 'associated with a certain type of domination. Each implies certain modes of training and modification of individuals, not only in the obvious sense of acquiring certain skills, but also in the sense of acquiring certain attitudes'. In other words, the technologies that maintain a dominant form of systematic reasoning about appropriate practice also inform our general senses and personal attitudes about what good literacy instruction 'is'.

2. It is important to note that the pedagogical practices I have chosen as examples are not the only ones that demonstrate current reasoning in early-literacy programming; certainly there are others. For example, Clay's *Concepts about Print* task demonstrates a line of reasoning that attaches 'natural' and 'appropriate' learning to the full writing system of alphabetic English, but a very different pedagogical approach, such as 'Direct Instruction' (e.g. Engelmann 1980, Engelmann and Bruner 1988) would demonstrate the same thing. The debates in the US about how reading and writing should be taught are many, but the things to note are the similarities in the overall structure of reasoning. These similarities outline the contemporary state of reasoning, and thus indicate how other ways of thinking, or other forms of literacies, are precluded.
3. See US Department of Education (2002a) *Final Guidance for the Reading First Program*.
4. Compare this to, e.g. the upside-down dedication page in *The Stinky Cheeseman*, which is printed correctly for its purpose and meaning, or the graphics in *Meanwhile*, where the image of mom yelling (megaphone-style) carries the message.
5. The booklets that have been used as a part of *Concepts About Print* (C.A.P.) for nearly 30 years are entitled *Sand* (Clay 1972) and *Stones* (Clay 1979), but Clay has more recently published two more: *No Shoes* (Clay 2000c) and *Follow Me, Moon* (Clay 2000b). The same concepts about print assessed earlier are also assessed in the newer booklets: the only difference between the old and the new is that the new booklets are in colour. However, the technologies of sign systems of seen as important for assessment are unchanged.

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