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Toward an educationally relevant theory of literacy learning: Twenty years of inquiry

Cambourne reviews and expands upon his well-known conditions of learning, particularly as they apply to the teaching of literacy.



Since the early 1970s I've been conducting research in natural settings. I've collected data from classrooms, homes, backyards, and supermarkets. The general focus of this research has been children learning literacy. Essentially I have been motivated by the need to find an educationally relevant theory of learning.

This motivation is not recent. It first emerged when I was a young teacher, and I made an observation that both surprised and confused me. It was this: Many of the children I taught found school learning extremely difficult (especially reading and writing). However, within this group there was a significant number who seemed capable of successful learning in the world outside of school. I was continually surprised and confused by students who didn't seem able to learn the simplest concepts associated with reading, writing, spelling, or math, who nevertheless showed evidence of being able to learn and apply much more complex knowledge and skill in the everyday world.

The popular wisdom of the time added to my confusion. The prevailing explanation of why these children failed to learn in school was couched in terms like *deficit* or *deficiency*. In summary form this explanation was:

- Otherwise “normal” students who fail to learn in school are deficient in some way;

- This deficiency comprised either a tangible neurological impairment, a less tangible disabling learning condition (which was typically given an esoteric “scientific” label), a cultural deficiency, or all of the above.

This popular wisdom conflicted with what I observed day after day in my classroom. I knew from my conversations and interactions with these children that they did not display such deficits when it came to understanding and mastering the skills, tactics, and knowledge of complex sports like cricket, or sight reading music, or running a successful after-school lawn-mowing business, or reading and understanding the racing guide, or calculating odds and probabilities associated with card games, or speaking and translating across two or three languages. Although these contradictions caused me some intellectual unrest, I was too young and inexperienced to know how to resolve them.

Twenty years later when I was conducting research into language acquisition I again confronted the same issue. At the time I wrote this in my personal journal:

Learning how to talk, that is, learning how to control the oral language of the culture into which one has been born, is a stunning intellectual achievement of incredible complexity. It involves fine degrees of perceptual discrimination. It depends upon abstract levels of transfer and generalization being continually made. It demands that incredible amounts be stored in memory for instant retrieval. It necessitates high degrees of automaticity of very complex processes. Despite this complexity, as a learning enterprise, it is almost universally successful, extremely rapid, usually effortless, painless, and furthermore, it's extremely durable.

This was the same issue that had confused me as a young teacher, namely: How could a brain which could master such complex learning in the world outside school be considered deficient with respect to the kinds of learning that were supposed to occur inside school?

This time, however, I was neither young nor inexperienced. I'd learned at least three things in the intervening years. First, I'd learned that the discontinuities that existed between everyday learning and school learning could be better explained as the result of the pedagogies that were employed in each setting.

Second, I'd learned that all pedagogies are ultimately driven by a theory of learning.

Accordingly, I tried to identify the theory of learning that drove the pedagogy I had used as young teacher. I discovered I had relied on a learning theory that could be summarised thus:

- Learning is essentially a process of habit formation.

- Complex habits are best formed (i.e., learned) if they are broken down into sequences of smaller, less complex, simpler habits and presented to learners in graded sequences of increasing complexity.

- Habits are best formed by associating a desired response with the appropriate stimulus.

- Strong association leads to strong habits.

- Associative strength is a function of frequency of pairing an appropriate stimulus (S) with an appropriate response (R), (i.e., practice makes perfect).

- Inappropriate responses (i.e., approximations) are incipient bad habits and must be extinguished before they firm up and become fixed.

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- Learners are too immature or underdeveloped to make decisions about their learning, so the process must be directed and controlled by the teacher.

This theory of learning resulted in a predictable pattern of teaching practice. Those “habits” that need to be “formed” were initially identified. These were then divided into subsets or hierarchies of smaller collections of subhabits. These, in turn, were then organised into “optimal” sequences or progressions, the mastery of any one being contingent upon the mastery of others earlier in the sequence. Repetitive drill and practice was the core teaching procedure employed. It was a theory which accorded special status to errors. Teachers (like me) who implemented this the-

ory not only seemed to spend a lot of time and energy trying to develop automaticity, we spent almost as much energy trying to extinguish errors from our students' repertoires.

I stated above that I'd learned three things in the intervening years. The third was this: I learned that the theory of learning that had underpinned my teaching still had strong currency among teachers, teacher educators, policy makers, curriculum designers, parents, and the general public. Although more than 20 years had passed since I had relied on this theory to drive my pedagogy, this theory (or one of its close relatives) still underpinned much of what went on in the name of education. I realized that the intellectual unrest I'd experienced some 20 years previously had suddenly resurfaced. This time, however, I felt more capable of resolving it.

A closer look at everyday natural learning

I began by asking myself the following questions: What is an exemplar of highly successful complex learning? What made it successful? I decided that learning one's native language was probably the most universal exemplar of highly successful complex learning that occurred in the world outside of formal educational institutions. I therefore decided to learn more about this phenomenon.

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I learned that there was a consensus that learning to talk is successful because human evolution had produced a nervous system that is specifically designed for the purpose. Initially I interpreted this to mean that it was merely a matter of neurological or genetic programming. However, I found other evidence that suggested there was more to it. For example, I discovered that there are humans born with intact and functioning nervous systems who

sometimes do not learn to talk, or have great difficulty. Prelingually deaf children are an obvious example (Sacks, 1990). I also found case studies of so-called "feral" children (i.e., cut off from human contact) who did not successfully learn language:

As recently as 1970, a child called *Genie* in the scientific reports was discovered who had been confined to a small room under conditions of physical restraint, and who had received only minimal human contact from the age of eighteen months until almost fourteen years. She knew no language and was not able to talk, although she subsequently learned some language. (Fromkin & Rodman, 1978, p. 22)

The existence of such cases suggested that the acquisition of the oral mode of language might also be contingent upon the availability of environmental factors and/or conditions. I was reinforced in this thinking by the important conceptual connections between learning, language learning, and the teaching of reading which Don Holdaway (1979), Frank Smith (1981), and Ken Goodman and his colleagues (Gollasch, 1982) were making.

I believed that if such conditions could be identified, they might provide insights into promoting literacy learning in schools. Accordingly, I began some research to identify the conditions that supported oral language acquisition. I spent 3 years of my life bugging a group of toddlers as they interacted with parents, neighbors, friends, and acquaintances in homes, playgrounds, supermarkets, and other settings. One outcome of this research was the identification of a set of conditions that always seem to be present when language is learned.

The conditions of learning

Dictionary definitions of the term *conditions* carry a range of potential meanings including "particular modes of being," "existing cases or states," "circumstances indispensable to some results," "prerequisites on which something else is contingent," and "essential parts" (Macquarie University, 1981). The meaning I have attributed to *conditions* is an aggregate of all of these possibilities. I want to convey the notion that the conditions I identified in this research are particular states of being (doing, behaving, creating), as well as being a set of indispensable circumstances that co-occur and are synergistic in the sense that they both affect and are affected by each other.

Together they enable language to be learned. Each of the conditions I identified is briefly discussed below. (These conditions are discussed more fully in an earlier book [Cambourne, 1988].)

Immersion. This condition refers to the state of being saturated by, enveloped in, flooded by, steeped in, or constantly bathed in that which is to be learned. From the moment of birth, young language learners are immersed in the medium they are expected to learn. It is therefore a necessary condition for learning to talk, one that is denied prelingually deaf children and "feral" children.

Demonstration. This condition refers to the ability to observe (see, hear, witness, experience, feel, study, explore) actions and artifacts. All learning begins with a demonstration of some action or artifact (Smith, 1981). Father asking at the breakfast table, "Will you pass the butter, please?" and the subsequent passing of it is not only a demonstration of what that particular sequence of sound means but also a demonstration of what language can be used for, how it functions, how it can be tied to action, what kind of language is appropriate for the setting we call "breakfast," and so on. Young learners receive thousands of these demonstrations. They are the raw data that must be used to tease out how language is structured. The concept of demonstrations can be generalized to all learning. Potential horse riders need demonstrations of how a horse is ridden before they can begin learning to ride. The same applies to tying shoelaces, riding bikes, and singing, as well as to reading, writing, spelling.

Engagement. Immersion and demonstration are necessary conditions for learning to occur, but they are not sufficient. Potential learners must first engage with the demonstrations that immersion provides (Smith, 1981). Engagement incorporates a range of different behaviors. It has overtones of attention; learning is unlikely if learners do not attend to demonstrations in which they are immersed. However, attention is unlikely if there is no perceived need or purpose for learning in the first place. Engagement also depends on active participation by the learner, which in turn involves some risk taking; learners can participate actively only if they are prepared to "have a go." Children learn to talk because they en-

gage with the demonstrations of talking and language use that are constantly occurring around them.

Expectations. Expectations are essentially messages that significant others communicate to learners. They are also subtle and powerful coercers of behavior. Young learner-talkers receive very clear messages that not only are they expected to learn to talk, but also that they are capable of doing it. They are not given any expectation that it is "too difficult" or that they might fail. Quite the opposite. Try asking the parents of very young children whether they expect their offspring to learn to talk. Pay attention to the kind of response that you get.

Responsibility. When learning to talk, learner-talkers are permitted to make some decisions (i.e., take responsibility) about what they'll engage with and what they'll ignore. Nature does not provide language demonstrations that are specially arranged in terms of simple to complex. No one decides beforehand which particular language convention or set of conventions children will attend to and subsequently internalize. Learners are left some choice about what they'll engage with next. Learners are able to exercise this choice because of the consistency of the language demonstrations occurring in the everyday ebb and flow of human discourse. Such demonstrations (a) are always in a context that supports the meanings being transacted; (b) always serve a relevant purpose; (c) are usually wholes of language; and (d) are rarely (if ever) arranged according to some predetermined sequence.

The significant others in young learners' environments communicate very strong expectations that the learning task will ultimately be completed successfully, while simultaneously providing deep immersion with meaningful demonstrations. But the learners themselves decide the nature of the engagement that will occur.

Approximations. When learning to talk, learner-talkers are not expected to wait until they have language fully under control before they're allowed to use it. Rather they are expected to "have a go" (i.e., to attempt to emulate what is being demonstrated). Their childish attempts are enthusiastically, warmly, and joyously received. Baby talk is treated as a legitimate, relevant, meaningful, and useful contribution to the context. There is no anxiety

about these unconventional forms becoming permanent fixtures in the learner's repertoire. Those who support the learner's language development expect these immature forms to drop out and be replaced by conventional forms. And they do.

Employment. This condition refers to the opportunities for use and practice that are provided by children's caregivers. Young learner-talkers need both time and opportunity to employ their immature, developing language skills. They seem to need two kinds of opportunity, namely those that require social interaction with other language users, and those that are done alone.

Parents and other caregivers continually provide opportunities of the first kind by engaging young learners in all kinds of linguistic give-and-take, subtly setting up situations in which they are forced to use their underdeveloped language for real and authentic purposes. Ruth Weir's (1962) classic study of the presleep monologues of very young children is an example of the second kind of opportunity. Her work suggests that young learner-talkers need time away from others to practice and employ (perhaps reflect upon) what they've been learning.

As a consequence of both kinds of employment, children seem to gain increasing control of the conventional forms of language toward which they're working. It's as if in order to learn language they must first use it.

Response. This condition refers to the feedback or information that learner-talkers receive from the world as a consequence of using their developing language knowledge and skills. Typically, these responses are given by the significant others in the learners' lives. When the learner-talker says, as he points to a glass on the table "Dat glass," the response from the parent if it's true (i.e., it is a glass) typically goes something like this: "Yes, that's a glass."

Exchanges like these serve the purpose of sharing information about the language and the degree of control that the learner has over it at any one time. The parent is supplying the missing bits of the child's approximation. The child is supplying the parent with an example of what he/she is currently capable of doing. It's as if the parent intuitively understands the importance of responsibility, and says to her-

self/himself: "I've no way of deciding which aspect of this learner's approximation is in need of adjustment just now. Therefore I'll demonstrate the conventional version of what I think was intended and leave the responsibility for deciding what is salient in this demonstration to the learner."

Applying the conditions of learning to literacy teaching

The identification of these conditions created a host of questions including: Could these conditions be applied to literacy learning? What happens when they are translated into classroom practice? Could they form the basis of an educationally relevant theory of literacy education?

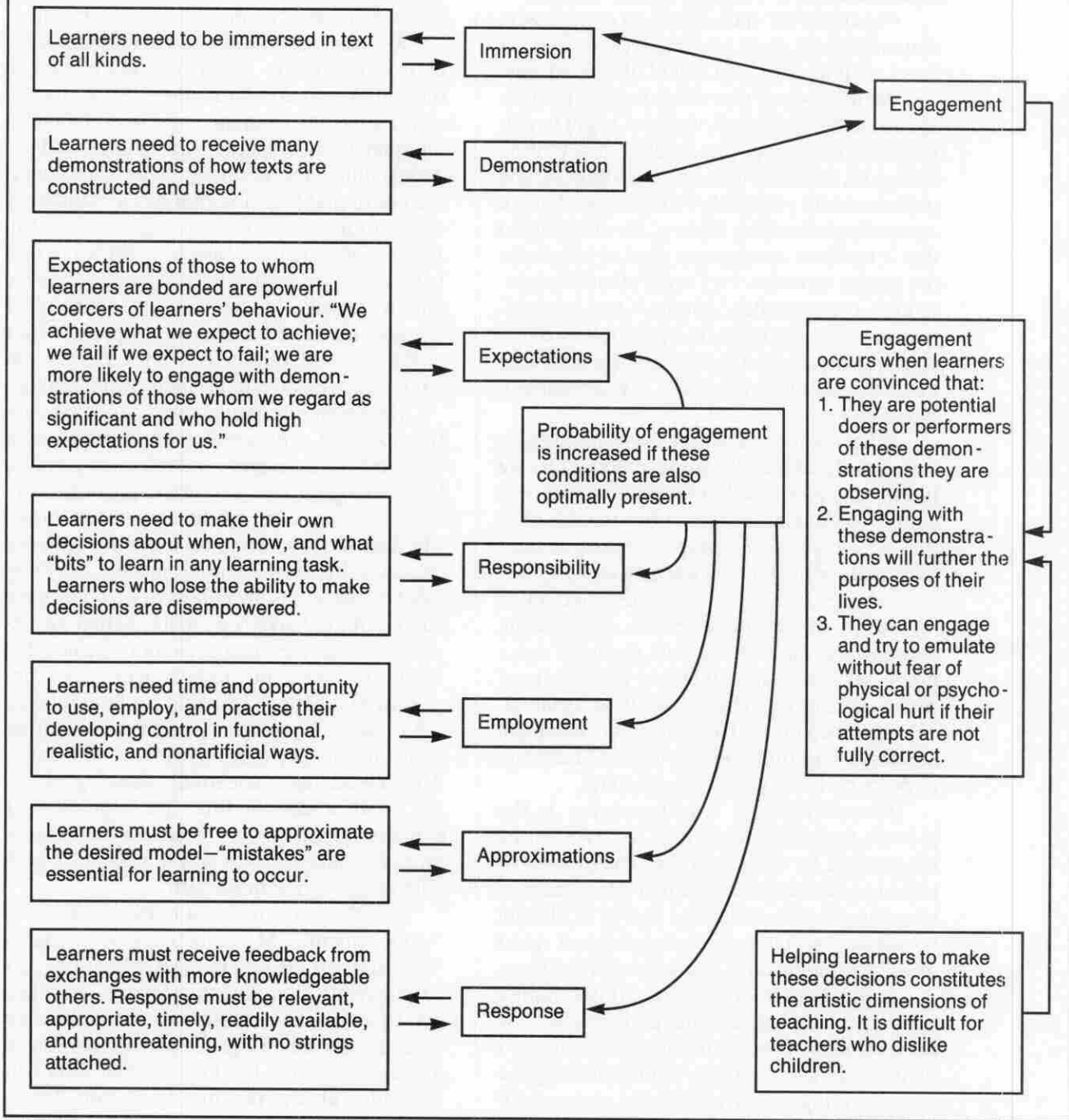
To address these and related questions, I sought the help of teachers. Ten years ago, we employed a "teacher-as-coresearcher" methodology (Barton, 1992; Cambourne & Turbill, 1991) to explore the ramifications of these conditions for literacy learning and classroom practice. In what follows I will briefly describe some of what's emerged from this coresearching project.

Could these conditions be applied to literacy learning? We spent some time jointly exploring this question. We decided that the conditions that supported and enabled oral language learning could be transferred to literacy learning. The flow chart in Figure 1 summarizes the consensus we achieved.

Our joint exploration suggested that "engagement" was the key. It didn't matter how much immersion in text and language we provided; it didn't matter how riveting, compelling, exciting, or motivating our demonstrations were; if students didn't engage with language, no learning could occur. We were forced to look closely at the factors that affected the degree to which learners would engage (or not engage) with the demonstrations of literacy that were provided. As a consequence we formulated the following "Principles of Engagement":

- Learners are more likely to engage deeply with demonstrations if they believe that they are capable of ultimately learning or doing whatever is being demonstrated.
- Learners are more likely to engage deeply with demonstrations if they believe that learning whatever is being demonstrated has

Figure 1
The conditions of learning: A model of learning as it applies to literacy



some potential value, purpose, and use for them.

- Learners are more likely to engage with demonstrations if they're free from anxiety.

- Learners are more likely to engage with demonstrations given by someone they like, respect, admire, trust, and would like to emulate.

We discovered that when these principles are consciously applied, teachers begin to employ a pro-learning, pro-reading, pro-writing discourse, which in turn sets in motion certain processes and personal relationships that are conducive to learning literacy. We also learned that if teachers consciously tried to maximize the degree to which they implemented expectations, responsibility, employment, approximations, and response, the probability of increasing the depth of learner engagement with the demonstrations they gave was dramatically increased.

What happened when these conditions were translated into classroom practice? As we began to explore the implementation of these conditions in classrooms, it became obvious that certain processes were necessary accompaniments of the literacy learning contexts that were created. So far we have identified transformation, discussion/reflection, application, and evaluation. It's hard to separate these processes from each other and from the conditions of learning. They co-occur and mutually shape each other. The seams between them are difficult to find. Despite this I will attempt to describe what we've learned so far.

Transformation. Transformation is the process that enables learners to "own" or be responsible for their learning. The process of making something one's own involves learners transforming the meanings and/or skills that someone else has demonstrated into a set of meanings and/or skills that are uniquely theirs.

In the domain of language, this is highly similar to creating personal paraphrases. Expressing some concept or knowledge in one's own words while closely approximating the core meanings involved seems to co-occur with the decision to take control of (i.e., assume ownership of, take responsibility for) the concepts and knowledge involved. Our data suggest that learning that is not accompanied by transformation is shallow and transitory.

Discussion/reflection are language process-

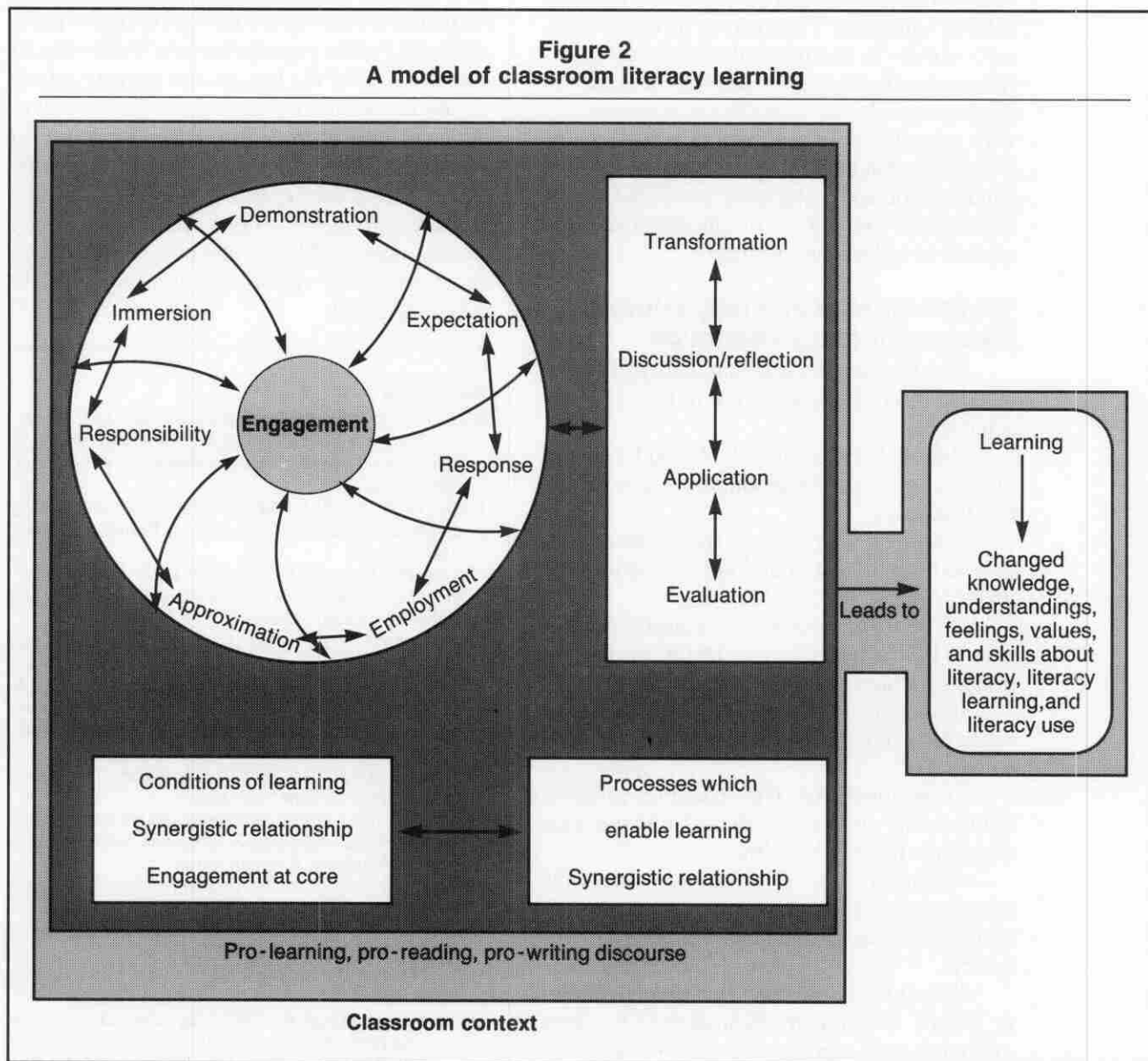
es that are fundamental to human learning. Both have a similar purpose in learning, namely, to explore, transact, and clarify meaning. However, they differ with respect to audience. Reflection is really a discussion with oneself.

My classroom data show that the process of transformation is enormously enhanced through discussion with others. Such discussion allows the exchange and interchange of interpretations, constructed meanings, and understandings. Furthermore, these data support the claim that learning that has a mandatory social dimension to it is usually successful. Just as toddlers can learn to control the oral language of the culture into which they're born only by socially interacting with others, older learners also need a myriad of opportunities to interact with others in order to clarify, extend, refocus, and modify their own learning.

However, discussion with oneself (i.e., reflection) not only creates opportunities for clarification, extension, and refocusing, it also leads young learners to make explicit their unconscious language and literacy "know how." My data show a strong relationship between effective literacy learning and the development of conscious awareness of how language and learning works (i.e., meta-textual awareness). Just as the prespeech monologues that Weir noticed seemed to be a necessary component of language learning, so "monologue with oneself" (which is a form of reflection) seems to enhance transformation. I feel confident in asserting that learning, thinking, knowing, and understanding are significantly enhanced when one is provided with opportunities for "talking one's way to meaning," both with others and with oneself.

Application is inherent in the condition of "employment." My data suggest a multi-layered relationship among application, discussion/reflection, and transformation. When two or more persons collaborate in addressing or trying to resolve a problem, they are forced to interact with at least each other. This collaboration always requires discussion. Transformation occurs as a consequence of the discussion that typically accompanies jointly constructing, understanding new knowledge, or mastering new skills. Often this new knowledge is reflected upon, and the new learning is further transformed.

Figure 2
A model of classroom literacy learning



Thus, teachers should create discussion opportunities for learners to apply their underdeveloped or naive knowledge and skills. These discussions often prompt other discussions. All this will maximise the probability that what learners hear and see others do, think, and say as they address the same problem will cause varying degrees of intellectual unrest which, in turn, will lead to a continuing cycle of transformation-reflection-discussion-reflection-transformation.

A continuous thread that runs through any teaching/learning process is *evaluation*. It is

embedded in the condition of "response" described above. Learners are constantly evaluating their own performance as they engage, discuss/reflect, transform and apply what is to be learned. It doesn't matter whether learners are engaged in learning to iron, play tennis, write an economics essay, tie shoe laces, or acquire the oral language of the culture; they are continually asking of themselves "How am I doing?"

Those who adopt the teacher's role in any teaching/learning situation are also constantly engaged in evaluating. They are continually re-

sponding, giving the learners with whom they interact information that answers the "how-am-I-doing" question. This help or feedback typically comes in the form of some kind of response from whomever happens to be in the teacher role. It can come through discussion with other learners involved in similar kinds of learning, but only if there is a strong sense of collaboration and collegiality within the group. Figure 2 is a summary of this model of learning applied to a classroom setting.

Toward an educationally relevant theory of literacy education

An educationally relevant theory of literacy education should have the following characteristics:

- Internal consistency: It should be able to explain both successful and unsuccessful literacy learning;
- Ecological validity: It should be applicable to both in-school and out-of-school contexts;
- Theory-into-practice congruence: It should be the basis for the design of instructional structures, processes, and activities;
- Pragmatic coherency: It should not make sense only to teachers and students, it should be "doable";
- Transferability: The principles inherent in the theory should be extendible to contexts other than literacy learning;
- High success rate: It should work in the sense that a significant number of learners acquire literacy as a consequence of applying the theory.

Since I first described this theory (Butler & Turbill, 1984) many thousands of teachers in hundreds of schools and school districts in Australia, New Zealand, the U.S., and Canada have adopted, adapted, and applied the principles to their own contexts. This theory has also been extended by creative educators to the teaching of mathematics (Semple & Stead, 1991; Stoessiger & Edmunds, 1987), music (Wilson, 1991), and teacher learning (Turbill, 1993).

The evidence that is emerging from these endeavors shows that the theory meets, in varying degrees, all of these criteria. I am quietly hopeful that someday I might be able to drop the word *Toward* from the title.

A classroom teacher himself, Cambourne was awarded a Fulbright Fellowship and a post-doctoral Fellowship at Harvard University in the mid 1970s. He has been a visiting fellow at the Language Center of the University of Arizona and at the Center for the Study of Reading at the University of Illinois. Presently, he is Head of the Centre for Studies in Literacy at Wollongong University where he has been working since 1982. He can be contacted there at Northfields Road, Wollongong, NSW Australia 2522.

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