Understanding and Using the Child's Will to Learn:
A Longitudinal Study

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Abstract

This longitudinal study traces the development of the learning patterns of 41 primary school children during their first three years of schooling. Using the Learning Combination Inventory, scale scores and students' verbal expressions concerning their use of sequential, precise, technical, and confluent processing are examined for change over time. Of particular note in the findings is the year-to-year consistency of learning patterns of the student subjects and the dramatic loss of "sense of self-as-a-learner" found among children whose learning patterns do not match the precise and sequential nature of the teaching/learning environment in which they are placed.

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The Dilemma of Schooling versus Learning

An assumption widely held is that children enter school to learn to be good students, i.e., to internalise information in order to perform well on standard assessments. However when we develop our learning environment on this premise, we fail to recognise the greater purpose of education: to enable a child to develop his/her learning processes. Clearly there is a difference between the schooling-socialisation process and the learning process. If we study the difference, we recognise that schooling involves formally training a person on how to conduct him or herself in the place called school. Learning, on the other hand, is a highly personal process by which is brought to bear the learner's informed, engaged, and reflective effort to develop his/her ability to interact with the world. Learning begins long before schooling!

There is a plethora of literature on brain development which suggests that a child entering school at the age of six has already established his/her learning processes. Shatz, (1997) for example, explains that brain functions are based upon the wiring of the brain from the time of conception. This occurs in two phases: the initial laying down of the circuitry; and the running of test patterns before the connections are all made. Based upon the response it receives, the brain selects which to keep and eliminates incorrect connections. In this way the brain 'learns'" (9). The brain is constantly testing how to focus and concentrate, recognise patterns, study the unfamiliar, and communicate. These experiences are what a child uses when s/he enters first grade and is required to focus on a book, quiet down, filter out extraneous noise, or feel good about learning. Not only does the research literature suggest that learning begins at conception but that patterns of learning processes or "patterns of representation" have begun to form long before formal schooling begins (Sylwester, 1995; Eisner, 1997). "Active and engaged care is essential for children's brain maturation and for social, emotional, and intellectual development "(Cohen, 1997, 11). Phillips (1987) refers to these processes as learning style, defining it as, "a measure of those ways of responding to learning tasks which generally facilitate or hinder children's learning" (32).

As vital as the nurturing of these processes are within the home environment, it is equally important to maintain an actively caring environment within the formal educational setting - the classroom because, "A child's manner of coping with learning in primary school is predictive of later academic attainments" (Phillips, 32). Phillips goes on to point out that frequently when a child's learning style does not fit the ideal behaviours of "schooling" the child's unfavourable behaviour is conceived simply as the expression of personality traits. " This he suggests is too narrow a view of the "determinants of learning-related behaviour" (32) Borkowski & Krause' findings (1985) concur with those of Phillips.

The research of Weiner (1979) and Hart, Leal, Burney & Santulli, (1985) explains the effect of this misperception of student behaviour upon the learner "As the child proceeds through the early elementary school years, metacognitive awareness is more and more likely to be a product of the instructional style of teachers in combination with the child's firsthand, individualised metacognitive experiences in a variety of learning and problem-solving situations" (22). The conditions for successful learning depend upon each learner developing those strategies which he or she can handle best, making good use of present abilities, on morale being maintained, and on the child being led into responsibility for his/her own learning. (Johnson and Pearson, 1975; Birrell, H. ,1979; Birrell, H., Phillips, C., & Stott D.,1985; Kurtz, B. & Borkowski, J., 1987).

Purpose of the study

If we accept that learning begins long before formal schooling, and if we accept that the process by which individuals learn is well established before they enter the school yard gate, then we, as educators, are confronted with the dilemma of how best to determine the child's learning processes and help the child develop those processes in an effective and self-fulfilling manner. This study addresses these concerns by examining 1) the nature of the learning processes which children have as they enter formal schooling; and 2) the degree to which these patterns are altered and/or affected by formal schooling.

Methodology

A three year longitudinal study was undertaken to study the formulation, consistency and the effects of schooling on students' learning patterns (Cronbach, L.J & Furby, L.,1970). Within the first three weeks of the 1994 school year, a 28 item self-report instrument, Learning Combination Inventory (LCI), Form I, (Johnston & Dainton, 1996), was administered to 56 Grade 1 students. During the same period in 1995, the LCI Form I was re administered to 48 of the cohort students upon entry into Grade 2. Again in 1996, the same instrument was administered to the remaining 41 members of the original cohort upon entry into Grade 3.

The LCI quantitatively and qualitatively captures a student's cognitive, conative, and affective interactive learning combination. Johnston (1996) posits that the interaction of the three mental processes (cognition, conation, and affectation) is manifested in four merged patterns of behaviour within each learner. These consist of sequence, precision, technical reasoning, and confluence. The sequential portion of the interactive learning pattern causes the learner seeks to follow step-by-step directions; organise and plan work carefully; and complete the assignment from beginning to end free from interruptions. The precise portion of the learning pattern causes the learner to seek detailed information and to process information carefully and accurately. When using this pattern, learner listens to the teacher and takes detailed notes; asks questions to find out more information; knows exact answers; and reads and writes in a highly specific manner. The pattern which involves technical processing engages the learner in working autonomously, "hands on", unencumbered by paper and pencil requirements. When relying on this pattern, the learner uses technical reasoning to figure out how to do things; works alone without interference; displays knowledge by physically demonstrating skills; and learns best from real world experiences. Finally, the confluent portion of the learning pattern precipitates the avoidance of conventional approaches and instead embraces unique ways of completing any learning task. This is that part of the learning pattern which gives us permission to take a risk, fail and start again; use imaginative ideas and unusual approaches; and improvise.

Through the use of four scale scores and three open-ended questions, the LCI is able to generate numerical scale sores for the four interactive patterns and is able to verify the scores through a cross matching of key phrases and words based upon established protocols. Scale scores are reported in three ranges of usage: "I Avoid" (7-15); "I Use as Needed" (16-25); "I Use First" 26-35. The LCI Form I, designed to be used with students ages 6-10, was administered in each instance by the same individual, the elementary school counsellor, in conjunction with the classroom teacher. Paired t-tests of individual student's scale scores for each of the three administrations were compared to ascertain whether an individual's scale scores varied among the three ranges from year to year. ANCOVA were also run to determine whether there was a relationship between a students' use of each of the four patterns and their placement on grade level or as a classified student.

Analysis of the Data

A comparison of Sequential scores between Grades 1 and 3 found no significant difference (p<.05). no significant difference was found when comparing scores of precision between the same pairing of grades (p<.05).no difference was noted for technical scores between grades 1 and 2. however between grades 2 and 3 an increase in students' technical scale scores at p<.05 was noted.(see table 1). confluent scale scores increased between grades 1 and 2 at p<.01 (see table 2); however, no increase or decrease of significance was reported between grades 2 and 3.

Table 1.
Measure of Technical Processing Year 1 Compared with
Technical Processing Years 2 and 3, n =41.

variable	mean	std. dev.	t value	corr.
t1	22.00			
t2	23.55	1.25	-1.24	.04
t3	25.76	5.05	-2.84*	.64**

*p< .05
**p<.01
corr. = person product-moment correlation

Table 2.
Measure of Confluent Processing Year 1 Compared with
Confluent Processing Years 2 and 3, n=41.

variable	mean	std. dev.	t value	corr.
c1	l8.43			
c2	22.36	6.74	-3.78**	.25
c3	22.36	4.53	4.53	0.00

*p< .05
**p<.01
corr. = person product-moment correlation

An explanation for the increase in technical scale scores between grades 1 and 3 can be found by examining both the "age and stage" of the learner and the learning activities of the primary school curriculum. As students develop a sense of independence as learners, those who authentically use their technical reasoning for learning appear compelled to express their frustrations or concerns with the increase in the amount of paper and pencil activities. At this level of development, they are better prepared to reveal this aspect of their learning combination, either through frustration or awareness of the terminology by which to explain how learning "works" best for them. The increase in the use of this learning pattern suggests a trend toward a divergence between schooling and learning.

The increase of confluent scores between grade 1 and 2 (p<.01) may be due to the fact that learners who would normally use their high level of confluence, have completed Grade 1 and may feel more prepared to use their unique approaches to learning having assimilated into the school environment sufficiently to be willing to take some learning risks. However, as the curriculum demands for specific information, correct answers, and following directions is reinforced during grade 2, these same students appear to lose their willingness to strike out on paths to learning which do not fit the established plan or set of classroom procedures. There is a clear levelling off of

the increase in the use of confluency during grade 2.

The ANCOVA run to determine whether there was a relationship between a students' use of each of the four patterns and their placement on grade level or as a classified student yielded interesting results. (see tables 3-5).

Table 3.
Factorial Analysis of Variance of Sequential
Processing in Year 2 (s2) by
Grade Level and Educational Type

source	df	ms	f
onlevel(l)	1	101.30	4.49*
edtype (e)	1	4.76	0.21
lxe	1	119.48	5.30*

*p< .05
**p<.01

Table 4.
Factorial Analysis of Variance of Technical
Processing in Year 2 (2t)
by Grade Level and Educational Type

source	df	ms	f
onlevel (l)	l	14.38	0.37
edtyp (e)	1	111.56	2.89 (a)
lxe	1	62.73	1.62

*p< .05, dp=.10
**p<.01

Table 5.
Factorial Analysis of Variance of Technical
Processing in Year 3 (3t) by
Grade Level and Educational Type

source	df	ms	f
onlevel (l)	l	16.62	0.23
edtyp (e)	1	95.91	3.29 (b)
lxe	1	10.25	0.35

*p< .05
**p<.01
dp=.08

A relationship between grade level, educational type, and sequential processing appears in year 2 at the p<.05. The same strength of relationship is not however continued in year 3. an explanation of this may be that by the end of grade 2, students are not performing in a sequential manner, i.e., following directions, tracking with instruction versus being distracted, and following the "rules of school", have most likely been identified by the teacher as unsuccessful students and referred for classification (educational type) or retained (off grade level). Between grades 1 and 3, the data indicate a trend towards an increasingly stronger relationship between grade level and educational type for students who display a high degree of technical reasoning (dp=.10) and by grade 3 dp=.08.

A correlation analysis for all variables (sequential, precise, technical, and confluent) year by year indicates that by the beginning of grade 3 there were virtually no correlations. At this point, the instrument was able to identify the interactive patterns as an interaction of four discrete patterns within each learner (see table 6).

Table 6
Correlation Among Third Year Variables

	s3	p3	t3	c3
s3	1.00	0.39*	-0.29	-0.03
p3	0.39	1.00	-0.11	-0.01
t3	-0.29	-0.11	1.00	0.28
c3	-0.03	-0.01	0.28	1.00

*p<.05
**p<.01

Discussion

Samantha, Kevin, and Mark are students whose stories as learners help interpret the above data by giving it a human perspective. Samantha would be termed the "Ideal Student." When she was administered the lci early in her grade 1 year she amazed the person who was administering the inventory when she announced that "nothing" frustrates her about learning. She was emphatic when she stated that "I have a system. I use it, and my teacher likes it." The administrator noted in the margin of the inventory that samantha presented herself in the guidance office with great confidence. She seated herself primly at her desk, smoothed out her dress, folded her hands and announced that she was ready. Samantha's consistently high scale scores in sequential and precise processing indicate her "fit" with schooling and the traditional school learning environment. she needs consistency, patterns, rules, and structure. her answers indicate that she responds well to a classroom in which these are used foremost.

Figure 1: Samantha

Grade 1

sequential	27	*What frustrates you about learning*: Nothing. I
precise	25	have a system. I use it. And my teacher likes it
technical	13	*How would you like to show what you know*:
confluent	19	Do spelling

What would make learning fun for you: I like school

Grade 2

sequential	27	*What frustrates you about learning*: When the
precise	26	teacher changes drechsons.
technical	11	*How would you like to show what you know*:
confluent	20	Answer lots of questions.

How would you teach others: I would teach just like Mrs. B.

Grade 3

What frustrates you about learning: When I don't have time to recopy my work.

sequential	29	*How would you like to show what you know*:
precise	27	Take a spelling test.
technical	13	*How would you teach others*: I would say sit
confluent	19	down and listen. Do your work carefully.

Kevin entered Grade 1 exhibiting a non-descript learning profile. His scores indicated no "I Use this First" range. As a learner new to school, he exhibited caution. He responded to the inventory administrator with short answers softly spoken. His teacher said he listened carefully, followed directions, and took no chances. by Grade 2 Kevin began displaying his willingness risks. This change in behaviour was not well-received by his teacher. He no longer sat quietly but offered ideas and had taken to "doing his own" thing when it came to assignments. "He doesn't always wait for directions and as a result, he is making more mistakes." His teacher and parents talked with him about this change. By Grade 3, Kevin appeared bored with school. "He can't wait for art class." His art teacher says he shows real originality. His written responses to the LCI in grade 3 reflect more of what he is being told to be as a student than who he is as a learner. He is trying to conform to others' expectations.

Figure 2: Kevin

Grade 1

sequential	23	*What frustrates you about learning*: I don't
precise	21	always understand what the teacher wants.
technical	15	*How would you like to show what you know*:
confluent	20	Give the right answer.

What would make learning fun for you: Thinking up stories.

Grade 2

sequential	20	*What frustrates you about learning*: When I
precise	20	can't use my ideas.
technical	15	*How would you like to show what you know*:
confluent	26	Draw something and talk about it.

How would you teach others: I would let students have more fun and draw or make-up

things.

Grade 3

sequential	20	*What frustrates you about learning*: Lots of things.
precise	21	
technical	19	*How would you like to show what you know*:
confluent	25	Get good grades
		How would you teach others: I would make school fun

Mark's scores indicate what happens when a learner is unable to take on the behaviours of the student as deemed necessary for promotion and success. Mark's scores over time change as he comes to grips with his educational environment.

Figure 3: Mark

Grade 1

sequential	35	*What frustrates you about learning*: When I only know a little bit about what the teacher is teaching.
precise	31	
technical	19	
confluent	15	*How would you like to show what you know*: Give me lots of papers to do.
		What would make learning fun for you: Learning about bicycle parts

Grade 2

sequential	27	*What frustrates you about learning*: The things we do in class are weird
precise	15	
technical	31	*How would you like to show what you know*. I wood do a page in a journal
confluent	27	
		How would you teach others: I would teach them about the subject

Grade 3

sequential	19	*What frustrates you about learning*: It's nothing but asering cwestons.
precise	07	
technical	35	*How would you like to show what you know*. I wood show how I play mines plus
confluent	27	
		How would you teach others: I would teach them by playing games

According the Phillips (1987) Mark is not atypical. "By their nature, pupil's learning styles are among those predictor variables that require a longitudinal dimension. Some children show behaviour unfavourable to learning in their first term and will adapt later to the demands of school; unfavourable characteristics in others may become more apparent with time and increased learning requirements. Thus measure of the predictor on more than one occasion is an important feature of any study which aims to examine the effect of learning styles on student performance"(32). Mark's expressions concerning his learning help explicate his change in scale scores from the ideal student ready to take in and remember lots of information in an organised manner to the real mark-as-learner, a child who uses technical reasoning and confluence (action and risk taking) to make learning work for him. The evolution of Mark's learning processes within a formal school environment are captured in the change over time of his LCI scale scores and his written responses to the three open-ended questions. The

following description of mark as a learner and as a student, provided by his guidance counsellor, gives further validation of the evolving learning profile recorded over the three year period.

"This child became a part of my case load because of his difficulties in the classroom. He would not follow directions; he would frequently be sent to my office. This child is one who spent a great deal of his second grade time in my office, sent there because he was not producing, or he was touching someone or something he should not be touching, or he was physically someplace where he should not be.

He is now in the third grade. These are some of the comments his teacher has given me permission to tell relate . First this individual now sits right next to his teacher . She feels he does not feel he can be successful in the classroom if he is sitting with other students. He needs to be completely by himself. He also will just look around. He is not malicious with it. He doesn't understand that he is disruptive. He will sing when he is working. He taps his pencil. She laments that there is no computer in her classroom because when he gets the opportunity to work hands on, he thrives. The way she has found success for him this year is to grade all of his manipulative tasks and has worked out with him a situation whereby whenever he has a paper and pencil or school task to do, she arranges it so he can do those in small spurts. 'It has been a constant negotiation and nothing is ever easy.'

Her response to my question, 'What kind of program do you think this child could be successful in?' was, 'It would have to be a vocational thing. The way school is set up now, there is no school on our level where he can be successful.' But she feels there are some teachers where he can be more successful than in other classrooms. Behaviour-wise, he has a lot of problems. When he is out of her situation, he goes into a highly structured environment, and he finds it impossible to sit and not move. That will frequently get him into trouble (Lesher, 1997).

Further Discussion

Mark is a classic example of the learner who finds it difficult if not impossible to use his learning processes within the highly sequential and precise learning environment in which he has been placed. Only when he is with a teacher who understands his struggles to conform is he able to use his learning processes in any type of an effective manner.

Of special note is the progressive development of the learner's sense of self as a learner vis a vis his/her learning patterns. Marks begins with the best intentions informed by the messages of both parents and teachers: Pay attention. Listen to the teacher. Learn what the teacher is teaching. These are the behaviours which are required, expected, and valued. A lack of any of these is considered a "deficit (of) knowledge" of how to perform in school. Kurtz & Borkowski (1987) use this phrase to refer to a student's lack of organised memory, impulsivity, or lack of monitoring of strategy selection (130).

Implications of the Study

Clearly, a lack of these "student" skills creates a chasm between the learner and the teacher. It is obvious that the manner in which the learner-teacher-school socialisation process occurs strongly influences the learner's perception of self. If the match between the learner's school behaviour and the teacher's school expectations is good, the new learner develops a positive sense of self, an "I can do" attitude.

If, on the other hand, the learner recognises that the manner in which s/he learns is

different from what the teacher expects, the learner begins to question his/her worth as a student. The learner's self-worth diminishes and confusion ensues. The change in both Mark's scores and his comments provide insights into his diminishing sense of self as a learner. If, as in the case of Mark, the conflict between Mark-as-learner and Mark-as-student continues unnoticed or unaddressed, the child's learning curve takes a tumble. Patterns of school behaviour appear which are not appropriate, acceptable, or tolerable. All interest on the part of the student wanes. Attention and motivation become areas of concern for the teacher and eventually the parent. The learner's sense of "Who I Am" in the classroom is in turmoil. The teacher-student connection is in jeopardy; the schooling-learning connection is in peril. In three short years Mark has gone from being a potential learner-student to being a frustrated learner and a disaffected student.

Key Concerns of the Teacher about the Student

Induction	Socialisation	Standardisation	Critical Juncture

Key Actions of the Learner (Elkind, 1981; Dweck, 1986; Johnston, 1996)

Age 4-5	Age 6-8	Age 9-10	Age 11-12
Enters school; assessed on readiness, ability to separate, health & wellness	Develops standard behaviours through socialisation into the formal organisation of schooling; seeks to receive approval for performance.	Is aware of self and what the teacher expects for performance; is becoming aware that what s/he wants to do and what the teacher expects are very different.	Determines that performance is acceptable or unacceptable; opts to buy into school or to drop out

Key Concerns of the Learner

Who am I outside of my world of home? How am I to act? What can I do to please?	Who am I to the teacher? How am I to please? Who am I to please?	Who am I as a student in the classroom? How can I be me? What if I can't please?	Who am I to my peers? How can I fit in? What do I care if I please?

At issue here are two agendas: the teacher's agenda to "school" the child and develop a student; and the child's agenda to thrive in the school environment and learn about the world around him/her. The child can easily become confused by the expectation of the first and the desires of the second. This study supports the frequency with which this scenario is played out over and over again, classroom after classroom.

The mixed agendas of schooling versus learning are what contribute to the child's feeling that "i am not capable." I am not capable of doing my work; I am not capable of demonstrating my knowledge. I am not capable of doing my work in a way that is

acceptable to my teacher. As a result of this conflict, the child is confused and begins to struggle with the question: To please the teacher, or not to please the teacher? To give in to the demands of schooling (which the child is now beginning to think are the same as learning) or to stand alone against a fine-tuned schooling machine? To admit "I am not capable of being a learner in this school environment" or to rebel and ignore the threats of teachers and parents alike? The frustration and trauma resulting from making this choice are very real. With either choice the child's self esteem is seriously damaged. That damage can carry with it a lifelong effect.

When the learner chooses to please the teacher and fit into the process of schools, the child begins to operate with great deliberateness and under much stress. The sense of what is not pleasing quickly shifts from, "My school work is not pleasing" to "I am not pleasing" to the teacher. Now the child must decide to shift from developing skills as a learner to developing the skills of pleasing the teacher. It does not take much prompting for children to sense that they need to demonstrate knowledge or work in a manner different from their current mode of performance. For an elementary student, it is very painful to come to the recognition that "the way in which I am doing my school work or the way in which I think about things" is not what the teacher expects, respects, or values."

To change or adapt one's natural process of learning is very difficult. As a result, many simply choose to opt out of the school program. Physically they remain, but mentally they abandon their interest or drive to succeed by the fifth grade. These students are now warehoused as one student described it "within these four white cinder block walls with kiddies pictures on them." "Me, how would I learn? I would go home. I would learn there. I would come back once in a while and see my friends. I just don't see any reason to sit here doing rows and rows of math problems or writing about what I did last summer. I've got better things to be doing" (Johnston, 1997).

When we first observe these student behaviours, we think, "The child just needs to mature." And the child thinks, "If I just keep trying, I will get better at doing this." The message, "Try Harder" is a little voice within us that says, "If I at least go through the motions, look like the person sitting next to me, mimic that behaviour, then maybe answers will come to me in the same way as they do to that person....maybe reading will come to me in the same way ...... maybe , maybe , maybe " when, in fact, going through the motions is not an authentic learning activity even if it is acceptable school behaviour.

In order for learners to succeed, they must do more than be "try hard" students. They must put forth measurable effort which results in successful performance. For example, if the learner is asked to prioritise information, manipulate information, and retain information, then the learner needs to engage the mental processes which will achieve this. If such a learning process is truly foreign to the student, then simply trying harder won't make a difference. Repeatedly doing something unsuccessfully can only increase frustration and lower self esteem.

At this point the issue of schooling versus learning looms even greater. The teacher observes the learner's behaviour and responds with "Hurry Up." "You are falling behind. You are holding us back. You aren't developing at the same speed that I need to have you develop. You aren't performing at the same rate as you are supposed to. I have school achievement standards to meet. How am I going to address this? I have 22 other students. At least 15 of the 22 are moving along at a certain rate. They are responding to the learning process as it is being presented in this classroom. What's happening here? It can't be me. I hope it's not me. I'm certain it can't be me because the other 15 are doing so well. It must be the child."

And the child feels the underlying "Hurry Up" message of schooling and responds with "I'm trying as hard as I can." All of this creates an emotional turmoil which causes the learner to lose the will or drive to learn because s/he doesn't feel any success or any

purpose or relevance in either the process or the content of what s/he is being required to learn. The teacher also loses the sense of achievement. "I'm not getting through. What could I be doing differently? Why isn't s/he responding? Why am I feeling this distance?" The frustration for both learner and teacher mounts. The teacher sees the learner as a problem student in the classroom: withdrawn, uncooperative, unresponsive to instruction, difficult, not performing up to grade level standards. Unless resolved what follows quite naturally are the standard actions of the "schooling" process: referral, testing, classifying, and labelling.

This is an unhealthy experience for both the learner and the teacher. How did it begin? This study confirms what others have reported over the past two decades: it began by losing sight of the learner and the learning process (Stott, 1978). It began when schooling replaced learning as the purpose for the child's presence in school. It continued by defining the learning process in a very narrow manner. The findings of this study suggest that it is time to begin to make a difference with each child by recognising and validating his/her ability and worth as a unique learner with the potential for contributing in a positive manner to the classroom learning environment and beyond.

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