READINESS AS A FACTOR IN ACADEMIC SUCCESS:

A GUIDE FOR TEACHERS

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INTRODUCTION

It is important that teachers be aware of readiness levels because readiness is a door to academic success. Readiness enables the child to perform well, to experience a sense of accomplishment and competence which lay the foundation for a positive self-image. Since readiness is a vital factor in a child's academic success, and since beginning teachers, in the confusion of large classrooms, may be inclined to overlook this factor, the purpose of this thesis is to present suggestions to these teachers so that they can recognize and provide for readiness in their students.

If the child works at his readiness level, he is comfortable and happy. If he is able to cope with the daily work, he is enthusiastic and has a sense of well-being. Consequently, he is free from the tension and anxiety which are deterrents to learning. But if the work is beyond his level of readiness, if school is a burden, it is unlikely that the child will perform well. Besides having difficulty in finishing assignments, he is inclined to have many errors. This can be a source of great embarrassment. Finding that he cannot function in a manner that merits satisfactory results, realizing

that he cannot properly absorb the material that is being presented, the child loses interest and responds with indifference. Consequently, he develops poor work habits and his problems become more complex. Working beyond his readiness level, a very bright child may become a low achiever, or even a failure, early in his school career. Feelings of inadequacy and inefficiency creep in and gradually lead him to believe that he is incapable of good work, that he cannot attain success, that he lacks intellectual ability. Hence, he develops a negative self-image and becomes a potential dropout.

It is important that teachers be aware of readiness levels because the child's ability to learn depends upon the components of readiness - maturation, motivation, and prior learning. The components, to a large extent, are interrelated. Each student progresses at his own rate - physically, socially, emotionally, and intellectually. Each student responds to particular forms of motivation and has his own special background of learning.

Because of the various components of readiness, the child may not progress at the same rate in all areas of the curriculum. A high level of reading ability

does not mean a high level of mathematical ability. A child may be well along in the school program before his mathematical ability is on a par with his reading ability. A child may be very quick in mathematics but because of his deprived cultural background he may be at a great disadvantage in the reading program. A child may have high reading and high mathematical ability in the primary grade, yet be unable to cope with printing in a commendable fashion for two or three years after entering school.

The various levels of readiness necessitate flexibility in curriculum planning and versatility in teaching methods and classroom management. The teacher must bear in mind the student's levels of readiness when determining where he should be working in a particular program, what projects he is capable of undertaking, and the amount of work he can comfortably handle in a given time. She must make allowance for the student who quickly completes reading assignments, but who requires considerably longer time to complete written work. She must give special consideration to the student who has a good knowledge of science and social studies, but who lacks ability in expressing himself on a written examination.

It is important that teachers have an awareness of readiness levels so that at no point in his academic career will the student ever feel that he cannot cope with the work, that there is no place for him in the system, that he should drop out.

> In the past we could perhaps salve our consciences by assuming our failing pupils would get unskilled jobs. But now the unskilled jobs are disappearing fast and higher-level jobs are growing in complexity, demanding the better-educated worker. An education equivalent to high school graduation is a must for every individual if he is to have any kind of life as a participant in our over-developed society (Melby, 1968, p. 32).

CHAPTER 1

Dependence of Readiness upon Prior Learning

According to Downing and Thackray (1972) the concept of readiness is not new in the field of education, for it dates back at least two hundred years. Downing and Thackray give a brief outline of the history of the concept. Although their views were not representative of the period, educational thinkers such as Comenius and Locke, in the seventeenth century, believed that the child himself should be the focal point in the educational process. Rousseau, in 1762, felt that education should be geared to the various stages of the child's development. Downing and Thackray quote a passage from Émile in which can be seen "the crude, but nevertheless clear, beginnings of the readiness concept."

> Give nature time to work before you take over her business lest you interfere with her dealings. You assert that you know the value of time and are afraid to waste it. You fail to perceive that it is a greater waste of time to use it ill than to do nothing, and that a child ill taught is further from virtue than a child who has learnt nothing at all (p. 10).

In their historical outline Downing and Thackray refer to Pestalozzi who, influenced by Rousseau's writings, "felt that the educator's duty was to assist

nature's development so as to secure a natural and harmonious progress (p. 11)." Pestalozzi (1894) believed

> All instruction of man is then only the Art of helping nature to develop in her own way; and this Art rests essentially on the relation and harmony between the impressions received by the child and the exact degree of his developed powers. It is also necessary, in the impressions that are brought to the child by instruction, that there should be a sequence, so that beginning and progress should keep pace with the beginning and progress of the powers to be developed in the child (p. 26).

According to Downing and Thackray (1972) Froebel (1887) perpetuated the ideas of Rousseau and Pestalozzi. He "saw the human being as a biological organism for which education needed only to provide nourishment and freedom (p. 11)." Downing and Thackray quote Froebel as having said, "All the child is ever to be and become, lies, however slightly educated, in the child, and can be attained only through development from within outward." In referring to Froebel's belief that child growth is a continuous development, Downing and Thackray point out that he was very close to a vital concept of readiness - that "each child has its own individual pattern of growth and rate of maturation(p. 11)." Dewey crystallized the concept of readiness and stated it so vigorously that educators in many countries were influenced by his philosophy. During the first quarter of this century,

the readiness concept became well established as one of our educational principles (p. 12).

However, according to Durkin (1972) the launching of the satellite Sputnik 1 by the Russians on October 4, 1957 resulted in an urgency for changes in education (p. 25). The 1960s were marked by a conflict between those who advocated acceleration in learning, the beginning of structured learning at an age earlier than that currently in vogue, and those who leaned towards the philosophy of Progressive Education as put forth by Dewey (pp. 25-30). Bruner (1960) hypothesized that "any subject can be taught effectively in some intellectually honest form to any child at any stage of development (p. 33)." But Hefferman (1960) felt that "The restlessness and anxiety of our times have been expressed in trying to force down in the curriculum learnings for which the child is neither physiologically nor psychologically ready and for which he sees no need (p. 316)." Durkin (1972) points out that Bruner was "simply urging educators to take another look at how they organized and presented instruction in fields like science and mathematics (p. 26)." Bruner (1960) meant that certain concepts could be introduced earlier in the school program if they were presented in accordance with the child's cognitive and developmental stage and then re-introduced

in sophisticated form when the child was capable of matured thinking (pp. 33-54).

According to Durkin (1972) parents became involved in the controversy over readiness for learning. Many were confused by such publications as "You Can Teach Your Baby to Read" on the one hand, and "The Conspiracy Against Childhood" on the other (pp. 28-29). Durkin feels that the controversy over readiness in the 1960s resulted in a more realistic attitude toward the young child. We see him for what he is: "a person living in a world that allows him to learn more, faster, and at an earlier age." Durkin also points out that the conflict between the two schools of thought resulted in an awareness for the needs of disadvantaged children, particularly in pre-school programs (p. 31). Durkin warns that we should never be so obsessed with the child's intellectual capabilities that we overlook what the traditionalists always placed great emphasis upon - social and emotional needs. "As educators we must be concerned with the <u>whole</u> child (p. 32)."

According to Ausubel and Robinson (1969) cognitive readiness refers to the "adequacy of the student's existing cognitive equipment for coping with the demands of a specified new learning task."

> In practice, readiness is indicated by the ability to profit from practice or learning experience. An individual manifests readiness when the outcomes of his learning activity, in terms of increased knowledge or academic achievement, are reasonably commensurate with the amount of effort and practice involved (p. 175).

Readiness, a "time honoured matter of educational concern," gives rise to problems so complex, that there are far more controversies and unanswered questions than there are points of agreement (p. 174).

General readiness has two components. The first aspect comprises possession of particular subject matter, knowledge for a particular learning task. The second aspect, that of developmental readiness, is a function of general cognitive maturity. Developmental readiness is a necessary condition for the learning of any particular subject matter. It reflects the individual's stage of intellectual development (p. 175).

One of the major factors in determining developmental readiness is maturation (p. 176), which will be dealt with in detail in Chapter 2. Regarding cognitive learning tasks maturation in itself is insufficient to explain readiness and prior learning must be taken into account.

Prior learning determines to a large extent a

student's readiness for particular subject matter. According to Huggett and Millard (1946) some background knowledge of what is being taught facilitates learning. It is difficult for city children to understand stories pertaining to rural life if they have never seen a farm. Similarly, rural children who are unacquainted with the city have little conception of skyscrapers, transit system, or high density population (p. 130). In a study of the paper industry, the child who has visited a pulp and paper mill has an advantage over the student who has not had the same opportunity. A visit to the fire station gives children background knowledge with which to develop an appreciation of service rendered the community by the fireman. Barring actual visits to particular places, audio-visual aids enable the student to acquire some previous knowledge for specific learning.

According to Gibson and Ebbeck (1971) children who have never had access to picture books are generally at a disadvantage. Since they have not reached the "What does it say?" stage, they are not interested in print. These children, therefore, need to develop the idea that printed words mean something (p. 131). It is reasonable to assume that, all other things being equal, a child unacquainted with books will require a more extensive readiness program for beginning reading than the child who

has been surrounded with books since his early days.

Strang (1970) believes that

> At any age level, readiness for reading depends upon the individual's previous acquisition of knowledge and skills. Proficiency in critical reading, the interpretation of literature, and personal development through reading all require a foundation of vocabulary knowledge, word recognition skills, and ability to comprehend the flow of words in sentences (pp. 1-2).

As a child's vocabulary increases (Frandsen, 1957) so does his ability to use context to determine unfamiliar words in his reading material (p. 179).

Prior learning influences both specific subject matter and developmental readiness (Ausubel and Robinson, 1969, p. 176). Ample experience with mathematical "sets" must precede mastery of number facts. To introduce the child to the concept of subtraction prior to that of addition would be to put the cart before the horse. Attainment of mathematical concepts must proceed in an orderly and hierarchical pattern, mastery of one step laying the foundation for the next. If a student does not have sufficient mastery of addition facts he will encounter difficulty in multiplication. According to Ausubel and Robinson (1969) "...more than any other discipline studied in school, mathematics requires that

the learner understand long, sequentially related, and hierarchically organized systems of propositions (p. 86)." It is necessary that a student have appropriate understanding of mathematical operations before he is ready to learn algebra. Ausubel and Robinson contend that it would be futile to expect a student to understand the syntactical relations in algebra without having a knowledge of the syntax of arithmetic. He must comprehend 3 + 2 before he can put x + y to practical use (p. 92). "... the existence of relevant anchoring ideas is the primary prerequisite for subsequent learning ... (p. 143)."

According to Ausubel and Robinson prior learning "contributes to general changes in cognitive readiness that are, at least in part, independent of the kind of subject matter studied. ...prior learning of specific subject matter influences both specific subject matter and developmental readiness." Elementary school science prepares the student for more sophisticated scientific concepts in high school (p. 176). In the case of a cognitively mature adult and a twelve-year-old child starting a course in astronomy, the adult is not in the same developmental position as the child with respect to concrete-abstract dimensions. The extra education the adult has had in specific subject-matter

fields has contributed to his general developmental readiness, although he has never studied astronomy (p. 192). The power of concentration developed in learning to play a musical instrument enhances a student's ability to concentrate in other subjects.

According to Seagoe (1970) prior learning must be associated with pleasant experiences in order to maintain in the child the element of interest. "Whether the child is interested in doing a given thing depends upon two factors: the amount of experience he has had doing it and the pleasantness of that experience (p. 23)." Seagoe believes that a child will avoid activities which relate to unhappy experiences. If early experiences with reading, writing, or mathematics give the child a sense of failure, he will endeavour to escape learning these skills, or he will become so tense that he cannot learn (p. 23). Children who have happy experiences with books, who enjoy bedtime stories as part of the routine of growing up, whose teacher is pleasant and makes books exciting, are more anxious to learn to read than are children who do not share the same advantage.

If tomorrow's learning depends on that of today, a great responsibility rests with the teacher on the introduction of new subject areas. According to Seagoe

(1970) "A quick, light, vivid, active exposure to a new area is the best way to assure that children will come back for more learning (p. 24)." In the early grades children are excited about science - it's fun! They assimilate scientific ideas within their range of comprehension as a sponge soaks up water. Their curiosity knows no bounds. Simple experiments create excitement and a thirst for more learning. Science in the early grades prepares the student for later learning.

Since prior learning effects readiness, the teacher must give considerable attention to arranging curriculum in proper sequence. "The more effectively learning sequences are organized for application of prior learning, the more efficient will be the learning (Frandsen, 1957, p. 19)." According to Ausubel and Robinson (1969) if learning is to be meaningful, new concepts must be anchored to existing ideas in the child's cognitive structure (p. 53). In order to comprehend a story, a child must have some understanding of the concepts put forth by the printed words. The student will derive much more information from a story about the lumber woods if he has previously seen a film pertaining to lumbering operations. A trip to the sugar woods will prepare him for a study of the maple sugar

industry. A tour of historic sites prepares the student for literature concerning early settlers. "It follows that new ideas and information will be learned and retained most efficiently when more inclusive and specifically relevant ideas are already available in cognitive structure...to furnish ideational anchorage (Ausubel and Robinson, 1969, p. 168)." Therefore, the child's readiness to learn depends greatly on the teacher's attention to the factor of prior learning.

According to Gibson and Ebbeck (1971), teachers need an understanding of the child's background, his home and community, in order to determine to some extent his prior learning and thus teach him effectively. The first reading lessons should consist of words from the child's background. "It would be useless to introduce words which had no meaning for the child (p. 127)." Sylvia Ashton-Warner (1963) taught Maori children to read by devising for each child a "key" vocabulary which consisted of words drawn from the child's own particular background and environment (pp. 31-50). Ashton-Warner insisted that reading material must be relevant to the reader - children should be compelled by their interests, rather than the teacher's commands. "I reach a hand into the mind of the child itself, bring

out a handful of the stuff I find there, and use that as our first working material (p. 34)." Ashton-Warner made reading books for her students from their own vocabulary, their own lives, their own drama, and their own locality.

Ausubel (1967) feels that if the culturally deprived child is to be given a fair chance to cope with more advanced subject matter, the teacher must take as the starting point his existing knowledge in various subject matter areas and intellectual skills "no matter how far down the scale this happens to be." Any subject matter that he is not capable of economically assimilating because of his cognitive development should be eliminated. Concentration should be on the acquisition of basic intellectual skills before attempting to teach him more sophisticated material. Ausubel deplores the situation in many urban high schools and junior high schools where pupils reading at a very low level, and whose command of English is entirely inadequate, are subjected to material completely beyond their range of comprehension. "Nothing more educationally futile or better calculated to destroy educational morale could be imagined! (p. 317)." A child who lacks sufficient prior learning of subject matter because of cultural deprivation

is at as great a disadvantage for learning in terms of readiness for a given level as if he suffered from a deficiency in intellectual endowment (pp. 317-318).

Wirth (1966) reports Dewey as saying that it is essential for the school to determine the child's background of experience so that it may be used as a starting point on which to build his learning. Dewey makes it clear that these findings are not to be treated as ends in themselves, but as the starting point from which any subject may be presented in order to develop in the child a readiness to learn (pp. 115-116). Wirth cites Dewey as saying "Geography is not only a set of facts and principles which may be classified and discussed by themselves, it is also a way in which some actual individual feels and thinks about the world (p. 114)." The child who has travelled extensively is in a vastly different position to the child reared in a slum district.

According to Beckner and Cornett (1972)

> ...what an individual is able to learn is in large measure determined by the knowledge that has already taken shape through the learner's experience. New learning must be compatible with or closely related to earlier experiences so that it may become integrated into the apperceptive mass. Education must then be designed to facilitate the orderly acquisition of experiences and knowledge required to develop a mature mind (p. 125).

While prior learning determines to a large extent the student's readiness for particular subject matter, "The pupil's own growth sets the goals and limits of his achievement...Growth proceeds by natural stages as the child's maturing mind unfolds (Hildreth, 1947, p. 3)."

According to Beck (1973) knowledge and experience to which children are exposed should be compatible with their neurological, physical and emotional maturity so as not to disrupt the total pattern and equilibrium of growth (p. xi). She believes that the child

> will assimilate academic knowledge when he reaches the necessary neurological, emotional, and intellectual maturity for such acquisition. To push such information at him before he is ready will result in his feeling pressured; in his much too early feeling of some shortcoming in himself; and quite likely in active or passive resistance against this external pressure (p. 31).

This aspect of readiness will be taken up in the next chapter.

CHAPTER II

Effects of Maturation upon Readiness

The second component of readiness is maturation which Logan (1960) defines as growth of all types - physical, motor, sensory, mental - which occurs under normal stimulating conditions (p. 35). A child's rate of maturation has a significant affect upon his behavior. His degree of maturity is reflected in his play, in his thoughts, whether spoken or written, and in his personal independence. How the child co-operates with his parents, teachers, and peers; how he copes with frustrations and new situations; the goals he sets for himself and the projects he undertakes - all these are dependent upon his rate of maturation (p. 36).

According to Greene and Petty (1963) learning is contingent upon the degree of maturation. "Learning cannot take place effectively in many fields until the organism reaches a certain level of maturity." Greene and Petty illustrate their point by drawing attention to the moth or butterfly bursting from its cocoon when ready. Tampering with the cocoon to induce premature emergence will mutilate the organism. To become fully matured, the organism must emerge from the cocoon under

its own power. When a child begins to talk or walk depends upon his physical and mental development, rather than his chronological age. The development of abilities such as riding a bicycle, using a pencil, or playing a musical instrument is determined by the child's level of maturation (p. 176).

Heredity and environment are prime factors in the process of maturation. According to Anastasi (1958) the relative influence of each factor has been debated for many years, but it is now generally accepted that both heredity and environment play a part in all behavior. She maintains that a human being is the product of its genes and its past environment, while present environment gives stimulus to immediate behavior (p. 197). She points out that "...although a given trait may result from the combined influence of hereditary and environmental factors, a specific difference in this trait between individuals or between groups may be traceable to either hereditary or environmental factors alone (p. 197)." Bronfenbrenner (1972) states that heredity and environment always operate in conjunction with one another. In exerting an influence on human development, neither factor can be effective without the other (p. 51).

Conceding that heredity and environment are both components of the maturation process, Ausubel and Robinson (1969) examine the wide variations in the relative importance attached to each factor by different individuals. At one end of the continuum are those who contend that heredity is the principal factor, those who reduce readiness to merely an unfolding of the child's genetic nature according to a predetermined and unchangeable schedule (pp. 176-177). "He carries with him his own timetable of growth, largely determined by hereditary factors; although he can be motivated, he cannot be pushed (Logan, 1960, p. 36)." Ausubel and Robinson (1969) trace the idea that maturation is "a process of 'internal ripening' essentially independent of environmental influence ..." back to Rousseau (p. 177).

Gesell and Thompson (1929) reached the same conclusions when they found that a twin trained for six weeks in stair climbing and cube handling had very little advantage over the other member of the pair who was trained for a much shorter time but at a later date (pp. 52, 92). "There is no conclusive evidence that practice and exercise even hasten the actual appearance of types of reaction like climbing and tower building. The time of appearance is fundamentally determined by

the ripeness of the neural structures (p. 114)." However, Hunt (1961) points out that while the experimental twin was performing the tasks prescribed by the experimenter, the control twin was not exactly idle and that whatever he was doing "made almost as much of a contribution to the development of the central processes required for mastery of the skills involved as did the practice on them (p. 323)." Hammill, Goodman, and Weiderholt (1974) criticize the large sums of money spent on sensorimotor training programs in the field of special education during the last fifteen years (p. 469). Their research reveals little evidence that such training benefits general learning abilities, whether children are perceptually handicapped or not (p. 476).

According to Gesell (1946) the development of the human organism - embryo, fetus, infant, and child - follows an orderly sequential pattern (p. 297) which "expresses itself in progressive differentiations... determined by intrinsic factors...The maturational mechanisms are so firmly entrenched that they are not readily transcended by training...(p. 314)." While pointing out that the organism must adapt to its environment, Gesell argues that ontogeny is primarily dependent upon maturation.

> From the moment of fertilization, intrinsic and extrinsic factors cooperate in a unitary manner; but the original impulse of growth and the matrix of morphogenesis are endogenous rather than exogenous. The so-called environment, whether internal or external, does not generate the progression of development. Environmental factors support, inflect, and specify; but they do not engender the basic forms and sequences of ontogenesis (p. 313).

Ausubel and Robinson (1969) believe that the "internal ripening" thesis is applicable to the sensory-motor and neuro-muscular sequences which take place during prenatal and early infancy periods of development. They agree that genic factors are largely responsible for the developmental pattern and rate of such activities as walking, climbing, and grasping - behavioral functions common to all members of the human species regardless of culture or environment. They contend that "Environmental factors influence developmental outcomes only if they are extremely deviant, and then serve more to disrupt or arrest the ongoing course of development than to initiate developmental progressions of their own (p. 177)." However, Ausubel and Robinson feel that the embryological model put forth by Gesell is not applicable to the "more complex and variable components of later cognitive and behavioral development where environmental factors <u>do</u>

make important contributions to the direction, patterning, and sequential order of all developmental changes (p. 178)."

On the contrary, environmentalists (Kohlberg, 1968) "have viewed the structure of behavior as the result of the association of discrete stimuli with one another, with responses of the child, and with experiences of pleasure and pain (p. 1019)." This conception of mental development, in the extreme, has important implications for education (p. 1019). The child, then, would be taught according to the general laws of learning, "believed applicable to the learning of all organisms (old or young, human or nonhuman) and to the learning of all behavior patterns (p. 1020)." Kohlberg points out that in such case there would be little need for a teacher to have an understanding of the development of a child's nature or an insight into his behavior at a given time. According to environmentalists there is little or no patterning in the development of personality or of the mind. Following this line of reasoning, "it is possible to teach a child almost any behavior pattern, provided one teaches in terms of the laws of association learning and provided one starts at an early age before competing response patterns have been learned." It would thus become necessary to start education early because early

learning would facilitate later learning (p. 1020).

Ausubel (1969) believes that environmental deprivation over a long period of time hinders intellectual development. "It is reasonable to assume...that whatever the individual's genic potentialities are, cognitive development occurs largely in response to a variable range of stimulation requiring incorporation, accommodation, adjustment, and reconciliation." The level of effective stimulation is in direct proportion to the variety of environment experienced by the individual (p. 192).

According to Deutsch (1967) it is unlikely that any child has ever operated in such an enriched environment that he has been sufficiently stimulated to utilize his full potential in all areas of development (p. 214). Deutsch made a study of the interaction of environmental influences and cognitive development. In making a micro-analysis of the environment he collected data on the social structure of the family, communication, economic circumstances, the educational histories of the family members, their child-rearing practices, dominance-passivity patterns and sex role determinations. He also attempted to determine the atmosphere of the home - relationships between parents and children, and short term and long range expectations concerning education

and goals. In this study emphasis was placed upon the evaluation of language and language development because not only is language the chief means of communication and interpretation of the environment, but it reflects culture - background influences - which in turn determines methods for solving problems (p. 215). The study revealed that "lower-class children, Negro and white, compared with middle-class children, are subject to what we've labeled a 'cumulative deficit phenomenon,' which takes place between the first and fifth grade years." Deutsch points out that while the socio-economic and race differences are apparent in the first grade level, it is worth noting that these deficiencies become more pronounced as the child progresses in school (p. 216).

John (1963) reports that children from lower-class homes have more limited vocabulary and poorer articulation than children of similar age from the middle-class sector of society (p. 814). Her study of the intellectual development of slum children reveals that the middle-class child has greater opportunity to develop his language skills. The middle-class home gives priority to language development in children (p. 815) whereas, "The acquisition of more abstract and integrative language seems to be hampered by the living conditions

in the homes of the lower-class children (p. 821)."

Bernstein (1967) reports grossly depressed scores on verbal tests as compared to higher scores on non-verbal tests for children from working-class homes. Bernstein explains this in terms of "linguistic deprivation experienced in their social background." He points out the difficulty of lower working-class children in trying to cope with the educational system. They certainly will not exhibit the same readiness level as their middle-class agemates. Their ability in learning to read will be inhibited by their backwardness in linguistic development (p. 227).

According to Anastasi (1958) efforts to determine the proportion of hereditary and environmental factors contributed to particular behavior have met with inconclusive results (p. 197). The highly controversial Jensen (1969a, pp. 50-51 and 1969b, p. 463) argues that eighty percent of human intellectual development is due to heredity. According to Bereiter (1969)

> The heritability of intelligence is unquestionably high, but what is more to the point is that with further social progress its heritability can only increase, because of the elimination of such sources of environmental variance as differences in the quality of education, nutrition, and medical care. One's view of the future beyond equality of opportunity must, therefore, be of a future in which differences in intelligence are virtually one hundred percent determined by heredity (pp. 310-311).

Herrnstein (1971) agrees with Jensen's thesis. "...the conclusion about intelligence is that...it is highly heritable (p. 57)." He echoes Bereiter when he says "The heritability of intelligence will grow as the conditions of life are made more uniformly wholesome; intelligence will play an increasingly important role in occupational success as the menial jobs are taken over by machines (p. 64)."

Lewontin (1970) disagrees with the emphasis which Jensen places on heredity in intellectual development. He contends that it is not possible to determine how much a particular trait is due to either heredity or environment. "Every character of an organism is the result of a unique interaction between the inherited genetic information and the sequence of environments through which the organism has passed during its development (p. 5)." Lewontin argues that environment may have very little effect on some traits, whereas other traits may be affected by the slightest change in environment.

Although Bronfenbrenner (1972) realizes that heredity plays a major role in intellectual development, he disagrees, both on theoretical and empirical grounds, with Jensen's thesis that eighty percent of human intelligence is genetically determined. He considers it

impossible to attach a single fixed figure to either heredity or environment in the development of any human trait (p. 124). He believes that

> If the heritability coefficient for a given ability or trait in a particular environment is low in comparison with other social contexts, this means that the environment is inadequate for the development of that capacity. Specifically, the low heritability coefficients and depressed levels of measured intelligence, observed in disadvantaged population especially Blacks, indicate that the environments in which these persons live do not permit the realization of their genetic potential (p. 125).

Jensen (1969a) upholds his debate of heredity versus environment by pointing out that children with superior intelligence actually determine their own environment because they are born, in all probability, of parents with intellectual superiority. Such parents would, naturally, provide their offspring with an environment that fosters intellectual development (p. 38).

According to Anastasi (1958) both geneticists and psychologists have demonstrated over and over again that the influence of the heredity and environmental factors depends on the contribution of one to the other (p. 197).

Gesell (1930) believes that "...no sundering distinction should be made between heredity and

environment. The two interact jointly (p. 275)." Haldane (1943) says that because of many uncontrollable variables entering any given situation, it would be difficult to arrive at any definite conclusion as to the proportion of heredity and environmental factors involved in intellectual development. He feels that the two components interact to the point that they cannot be entirely separated (pp. 147-153). "We must no more forget heredity when we are trying to improve environment than we must forget environment when trying to improve heredity. A complete concentration on one side of the problem can only lead to short-sighted action (p. 180)." According to Hunt (1964) "...any laws concerning the rate of intellectual growth must take into account the series of environmental encounters which constitute the conditions of that growth (p. 212)." After reviewing several studies carried out to ascertain the proportional contributions of heredity and environment to intelligence, Loevinger (1943) concludes that no acceptable estimates have been reached (p. 750). However, she recognizes the dynamic interaction of the two factors in the genesis of intelligence (p. 755). Anastasi (1958) concludes that the contribution of heredity and environment to any given trait does not remain constant. The contribution of

heredity varies according to environmental changes. Likewise, environmental contribution is relative to hereditary conditions (p. 197).

Kohlberg (1968) points out that basic mental structure results from an interaction of heredity and environment rather than either one directly (p. 1020). He feels that this interaction leads to cognitive stages which evolve from one another as early cognitive structures are affected by adaptation to the external world (p. 1021). Here we see a fusion of the theories of maturationists and environmentalists into one of cognitive-development.

Sullivan (1967) sets forth in concise form the cognitive stages through which Piaget believes the child passes in the process of intellectual development.

1. Sensorimotor (birth to about 2 years)
2. Preoperational (about 2 to 7 years)
   (a) preconceptual thought (about 2 to 4 years)
   (b) intuitive thought (about 4 to 7 years)
3. Operational (about 7 to 16 years)
   (a) concrete operational thought (about 7 to 11 years)
   (b) formal operational thought (about 11 to 16 years) (p. 4).

During the early part of the sensorimotor stage no concepts are attached to sensory experience. There is no

object permanence. Once a toy is out of sight it no longer exists. Piaget states that sensorimotor intelligence acts like a slow-motion film, in which the pictures are seen in succession, but without fusion, and so without continuous vision for understanding the whole. Through experiences with the world, the child develops object permanence and primitive concepts of space, time, causality, and intentionality, which were not present at birth, develop and are incorporated into present patterns of behavior (p. 4).

The preoperational stage has two substages: preconceptual thought and intuitive thought. The preconceptual thought initiates the beginning of what Piaget calls conceptual intelligence. Behavior begins to be mediated by signs and symbols, especially words and images. During this period the child develops imagery and memory but lacks an understanding of conservation of substance. Pour some beads from one container to another of different shape and the child will say there are more or less, depending on the shape of the second container (pp. 5-6).

The formal operational stage marks the emergence of problem solving at a higher level than concrete experience. Formal thinking appears. Instead

of the concrete action-oriented thought of the child, the adolescent forms theories. He begins to hypothesize and work out inferences that would follow. He can now use logic and mathematics to work out his problems. Students will develop conservation of volume and weight (pp. 8-9).

It has been found that ages given by Piaget for certain stages of development vary according to intellectual endowment, experimental background, and education (Ausubel and Robinson, 1969, p. 193). "Piaget's age levels...are nothing more than an average approximation set for purposes of convenience (p. 182)." However, this does not in any way invalidate the stage concept. Regarding the use of cognitive stages as a curriculum pacing device, investigators say that "expectations concerning the acquisition of subject matter would have to be related not so much to the subject's chronological age as to his intelligence, culture, and experiential background, and that it would vary between subject-matter areas (p. 193)."

Since children progress year by year by grade from the time they enter public school, and since within the framework of "progressive" education the child advances at his own rate of learning and does not "fail"

a grade, determining curriculum content by grade becomes a very complex issue. It would be impossible to designate a certain number of readers in a particular reading series to be "covered" before the child enters Grade 2. With eighty children in Grade 1 there is a wide range of ability. Some of these children are excellent readers on leaving the primary grade. Others are barely beginning to read when they enter Grade 1. This spread of reading ability is evident in all grades. As work carried out in all grades depends to a very great extent on the student's reading ability, it presents no difficulty to realize that a master-plan curriculum laid down by other than the classroom teacher is inoperable. On the other hand, the various levels of readiness in a particular grade need not prevent curriculum advisers from suggesting particular topics to be dealt with in such subjects as science, health, and social studies. Such practice allows for continuity of subject matter from grade to grade. According to Ausubel and Robinson (1969) the onus for curriculum-pacing then falls on the classroom teacher, who knows the students, and who can determine the manner in which particular material is to be presented to the learner so that it will be best understood (p. 201). Research has shown that conservation of substance can be taught to some children at an age earlier than that specified by

Piaget, while others simply cannot absorb the concept until a particular age (pp. 194-199). The more precocious child should not be held back because others in his class mature at a less rapid rate. He requires enrichment in subject matter and it is vital that the classroom teacher provide him with such in order to maintain his interest in learning.

Junior high is a critical period when children are in a transition stage from concrete operational to formal operational thought. This becomes particularly obvious in the realm of math and science. Ausubel and Robinson (1969) say that experimenters have found that children can solve problems involving hypothetical deductive thinking and ideas about ideas at an earlier age than that proposed by Piaget, provided judicious use is made of empirical props (p. 200).

> A particular twelve-year-old boy may use formal logical operations in his science course in October, but may revert for no apparent reason to a concrete level of cognitive functioning in November or even several years later, when confronted with an extremely difficult and unfamiliar problem in the same field (pp. 182-183).

The spiral curriculum approach permits the introduction of topics in science, social studies, and health, early in the child's academic career. The changing seasons, energy, the human body, space, to name but a

few, can all be introduced at an early age and in keeping with a child's age and experience. The same topics may be reintroduced from time to time throughout the child's academic career and in more sophisticated form.

If the readiness level of all students in all areas of subject matter is to be respected throughout the learner's academic career, there must be great flexibility of curriculum-pacing. The child is not made to serve the system; the system must serve the child. This should be his inherent right. The high school and university must be prepared to accept the child where he is, not where he "should be." Children of junior high age cannot be expected to remain in elementary school, nor can children of high school age be expected to remain in junior high, because of the socialization and self-image factors.

In order to serve the interests of the student, it is essential that the teacher have a clear understanding of the process of maturation and its effect upon the readiness level of the child for particular subject matter at a given time. Coupled with maturation is prior learning. The two fit together like a lock and key. Regarding these factors which come to bear on the child's readiness level at any time, I think Durkin (1972) sums

up the whole issue very neatly.

> Nothing that we know about humans suggests that heredity alone accounts for an individual's capacity to learn, nor, on the other hand, does anything or anyone suggest that only environmental factors determine it. At various times, it is true, both nature and nurture have been placed on a special pedestal of honor by psychologists. Even amidst the adulation, however, the one not being raised on high was never cast aside completely...each child's capacity at any given time is the product of both nature and nurture. More specifically, it is the product of an interplay among genetic endowment, maturation, experiences, and learnings. Just how this interplay takes place awaits a definite explanation. For now, though, it seems correct to say that a child's attained capacity at any given time is something he has inherited, grown into, and learned (pp. 50-51).

CHAPTER 111

Relationship of Motivation to Readiness

While prior learning and maturation are significant components of readiness, motivation is also a key factor. In referring to the concept of motivation, Berlyne (1971) claims that "There is no universally recognized definition of this term...(p. 186)." However, for purposes of this thesis I shall consider motivation to be the student's desire to learn - to know and understand. Gibson and Ebbeck (1971) refer to motivation as "a movement - a power - a strong urge to do something (p. 133)."

> Children are by nature exceedingly active, curious and enthusiastic. Each of these words indicates motivation in operation. Motivation is essential in developing readiness. Although a child can be physically mature and have many opportunities to learn a task he will not learn it unless motivated to do so (p. 128).

Ausubel (1969) considers cognitive and motivational aspects of learning to be "inseparably intertwined in any real-life learning situation (p. 412)." According to Miller (1971) motivation and cognition "tune each other, and affect each other (p. 171)." Charles (1964) feels that maturation and prior learning are rendered

"inoperable when motivation is lacking (p. 1)." Anderson (1954) considers that "If we think of the person for the moment as comparable to a machine manufacturing a product, we can think of motivation as the fuel or energy that goes into the machine to make it run...(pp. 13-14)."

Motivation may account for the wide range of achievement in a group of students who have similar mental ability and comparable prior learning. Motivation is affected by the student's temperament, emotional state, habitual interests, and attitudes towards learning. Referring to the motivational phenomenon, Hebron (1966) points out that "The differences which exist between individuals in capacity to learn may derive not from a better 'brain' but from some system which activates the brain prior to its mental operations (p. 16)."

The role of motivation (Ausubel, 1958) in learning is a topic of much controversy among psychologists. Positions vary from those who contend that no learning takes place without motivation to those who discount motivation as a necessary ingredient of the learning process (pp. 572-573).

Frostig and Maslow (1973) point out that ability

and motivation to learn are closely connected. Because of a sense of failure, children with low abilities experience little motivation. In turn, low motivation is a deterrent to endeavouring to succeed. Low motivation may result in atrophy of existing ability, whereas increased motivation may facilitate greater learning ability (p. 151). This indicates the necessity for the student to work at his own level of readiness. Therefore, the teacher must give individual differences careful attention so that each child will be enabled to work at his readiness level in all subjects and thus maintain motivation. Gibson and Ebbeck (1971) point out that "We must note carefully the connection between motivation and the catering for individual differences (p. 135)."

It is not difficult to realize the predicament of the student who, because of his particular ability, does not fit into any reading group in the class but who, for purposes of "convenience," is expected to operate (as best he can!) in one of the existing groups. This situation may apply to the bright child as well as to the one who learns more slowly. The bright child's ability may suffer if the work is not sufficiently challenging. If he is eager to move ahead, he should

not be held back because of the students who move slowly. He needs plenty of enrichment so that he can work at his readiness level and thus maintain his interest. Hoffman and Ryan (1973) believe that "The natural curiosity of a child will not long exist unless it is fed. It will perish in a vacuum. The content of learning experiences is the 'stuff' which feeds this need (p. 10)." The student has a better attitude toward learning and greater incentive to achieve if he works at his own level of readiness.

Children do not necessarily have the same degree of readiness in all subjects at any given time. A child who is considered to be below average in reading ability may have average or even above average ability in mathematics. On the other hand, it is not uncommon in the early grades that precocious readers need to move slowly in the math program in order to ensure success.

Ausubel (1969) distinguishes between intrinsic and extrinsic motivation. Maw (1971) believes that all motivation is intrinsic, there being no extrinsic motivation. "There may be extrinsic incentives, fancy gadgets for learning, external rewards and reinforcements, but they mean nothing in the long run in such areas as

curiosity, creativity, and capacity unless they become part of the affective domain of the human being (p. 97)." Ausubel (1969) regards intrinsic motivation to be "...the acquisition of knowledge as an end in itself or for its own sake (p. 413)." He points out that intrinsic motivation in the student is an essential factor in the day to day work because so much school learning appears to be irrelevant to daily living (p. 414). It may be difficult for a student to rationalize the fact that a Shakespearean play can be of any real value to him if his aim in life is to operate a garage. The English student may see little value in a French course if greater emphasis is placed on written assignments than on the oral aspects of the program. He may experience a lack of motivation if his environment gives him no opportunity to use his secondary language in a practical way. Ausubel (1969) contends that it is vital to the cognitive development of the child that the value of learning as a tool in itself receive proper emphasis. Intrinsic motivation will induce the student to continue learning long after graduation (p. 414). Gibson and Ebbeck (1971) agree. "We know that intrinsic motivation is much better for learning than extrinsic motivation.

As teachers we must try, whenever possible, to make the children so interested in their work that their motivation will be intrinsic (p. 26)." According to Day, Berlyne, and Hunt (1971)

> There is evidence of a realization that intrinsic motivation is a useful tool in the hands of a skilled teacher. Through its judicial manipulation, he can increase learning while decreasing discontent and the negativism that exists in education today. He can make education interesting and rewarding in itself, so that the student remains excited by the learning process long after he has left the halls of formal education (p. iii).

Ausubel and Robinson (1969) feel that teachers should be aware of Maslow's proposed hierarchy of needs in the process of human motivation. Before a child can be expected to learn, these needs, in the following order, must be satisfied: physiological (food and drink); safety; security (love and belonging); and self-esteem (a good self-image). It is important that the teacher know the need level at which the student is operating (pp. 354-355). It is unlikely that a child will be motivated to do well on a forthcoming exam if there are economic and social problems at home. According to Hoffman and Ryan (1973) "...children who have unmet primary needs cannot be expected to function in a manner designed to meet higher needs ... Hungry children

do not understand questions of good citizenship! They are not on that needs level (p. 223)." The teacher's awareness of the student's need level is of utmost importance in enabling her to arrange learning situations in which the child will maintain a high level of motivation and thus operate at a higher level of readiness.

Many students experience lack of intrinsic motivation. According to Ausubel (1969) this is a characteristic of the culturally deprived child whose family, peers, and community do not value education for itself and whose aspirations for scholarly and high vocational achievement is non-existent. In such cases extrinsic motivation must be resorted to (p. 415). Gibson and Ebbeck (1971) describe extrinsic motivation as that which occurs when a person pursues a learning task for reasons which lie outside it. If a boy builds model airplanes because he wants to please his father, an ex-pilot, rather than for his own personal interest in planes, he is extrinsically motivated for the task (p. 136).

Miller (1971) argues that "most children are likely to show rudiments of intrinsic motivation right from scratch, without learning, without understanding, without cognition (p. 183)." Later in life, he continues, with the growth of cognitive abilities and suitable

enthusiasm for the subject matter, her style of teaching and her warmth of personality, her tendency to praise and encourage, her rapport with the students will promote the desire to learn.

Gagné (1965) feels that motivation for achievement is one of the most useful tools in arousing a child's desire to learn. He defines achievement as wanting to be able to do something (p. 210). Ausubel and Robinson (1969) believe that school achievement leads to feelings of adequacy and self-esteem (p. 357).

In order to achieve in any given subject, the student's level of readiness must be carefully considered. Unless a child is so gifted that he learns to read incidentally, without specific teaching, before he enters school, he will need careful step-by-step instruction in order to acquire reading skills. The teacher must be continually assessing his readiness for new learning before progressing to the next step. Children who are successful are normally anxious to move on to the next story, the next reader, and the next grade. They are enthusiastic learners. But if the child finds the work too demanding, if he has too many mistakes in his daily work, if he requires so much extra help from the teacher

that his peers suspect he has a learning problem, he will become apathetic and lack incentive to achieve. "Nothing succeeds like success" is as true today as it ever was. Ausubel (1969) says that the lower-class child's alienation from school is a "reflection of the cumulative effects of a curriculum that is too demanding of him, and of the resulting load of frustration, confusion, demoralization, resentment, and impaired self-confidence that he must bear (p. 408)." According to Frostig and Maslow (1973)

> The child's self-concept must be considered the crucial factor in any child's success or failure...When a child is overwhelmed by anxiety about his performances, whether in school or at home, he cannot focus on a task. When a child feels that he is a worthwhile human being, who respects himself and is respected by others, then his natural curiosity will enable him to concentrate on a task, and learning becomes possible (p. 84).

Crow (1958) feels that failure to achieve adequately in terms of expectations may lead to discouragement and further failure (p. 101). The teacher should endeavour to motivate each student to the extent that he will experience success within the limits of his ability. This is not an easy task for the teacher who has extremes of levels of readiness in her class (p. 103).

A teacher may arouse in the child a desire to achieve by giving him an opportunity to achieve in other than academic work. The student may be capable of excellent service to the librarian. He may be an expert in attending to audio-visual equipment. Achievement in basketball or other extra-curricular activities may provide the necessary motivation to excel in academic subjects. Therefore, it is necessary that the teacher know her students, their interests, and their problems. She must "tune in" to the student and start where he is, not where he "should be." The teacher should use all the methods at her disposal to create in the unmotivated child the desire to learn. Motivation to achieve must be carefully attended to from the time the child enters school. In speaking of culturally deprived children, Goldberg (1967) says that "At older levels, reinforced by many years of failure, caught up in a cycle of 'progressive retardation,' the motivation to achieve becomes weaker and weaker (p. 379)."

Although extrinsic motivation may be useful and practical to get the student "off the ground," it appears that in order to be of real value it must be channelled to intrinsic motivation. Ausubel (1969) points out that the high drop-out rate of culturally

deprived children in high school indicates that extrinsic motivation - appeal to job acquisition, ego enhancement, status, and prestige is not very satisfactory (p. 414). "...intrinsic motivation for learning is more potent, relevant, durable, and easier to arouse than its extrinsic counterpart (p. 414)." However, Gibson and Ebbeck (1971) point out that in most learning situations motivation cannot be neatly categorized into intrinsic and extrinsic, but is a combination of the two and "hinges on some blend of personal concern for the work itself and some concern for extrinsic factors (p. 136)." Ausubel and Robinson (1969) warn against the danger of too much emphasis on ego-enhancement, prestige, and status. It may lead to the student's attempting to obtain unrealistic goals which in turn may lead to emotional disturbances with disruption of learning. If the student sets his goals too high in academic or vocational learning he may fail and suffer loss of self-esteem (p. 360). As the student progresses in his educational career he must learn to respect his own ability and set his goals accordingly. He must determine his own level of readiness and set his own pace. His teachers must respect his decisions.

It may be sensible at times (Ausubel, 1969) for the teacher to ignore the child's motivational state and

simply teach him as effectively as possible. This procedure on short-term and limited-quantity learning can do no harm. When the child discovers that he can actually perform, the satisfaction he derives may motivate him to learn more (p. 415).

A teacher may find it necessary at times to rate a student higher than his daily performance warrants. The child, having developed an inferiority complex because of previous low ratings may suffer from tension, a deterrent to learning. The joy of receiving a "Good" instead of his traditional "Fair" releases the tension and gives the child a good self-image. Invariably, before long the daily work improves to the extent that the "Good" rating is actually in order.

Motivation, an essential factor in the student's readiness to learn, is not simple. Motivation depends upon many things, some of which the school has little or no control. But if teachers take advantage of those factors of motivation which are within their reach, a great deal can be done to raise the readiness level of some students. Motivation is the springboard which releases potential for learning, potential generated by maturation and prior learning.

CHAPTER IV

The Recognition of and Provision for Readiness in the Classroom

In order to provide for readiness the teacher must give attention to prior learning, maturation, and motivation. As mentioned in Chapter 1, prior learning determines to a large extent the student's readiness for particular subject matter. A child who has never had picture books, who does not realize that print "says something" is not as ready for a formal reading program as the child who has been surrounded with books since a very early age. A student who has not mastered the addition facts will encounter difficulty in multiplication. The teacher must ensure that the student's prior learning is adequate to undertake more advanced work.

A child's degree of maturation significantly affects his behavior. In Chapter 11 it was pointed out that learning cannot take place effectively in many fields until the child reaches a certain level of maturity. A child's degree of maturation determines the concepts he is capable of acquiring. The young child lacks an understanding of conservation of substance. It is not until adolescence that the child develops conservation

of volume and weight. Children younger than eight or nine years of age cannot understand velocity, because it involves both distance and time. Therefore, the teacher must give consideration to the child's degree of maturation in the event of starting new work.

In Chapter lll it was pointed out that if prior learning and maturation are to be effective in the child's readiness to learn, they must be intertwined with motivation. Without motivation, prior learning and maturation are rendered inoperable (Charles, 1964, p. 1). Motivation facilitates learning. Low motivation is a deterrent to learning. Low achievement and a sense of failure interfere with motivation. Thus it is imperative that a child work at his readiness level.

The teacher can play an extremely important role in the child's motivation. She can set the stage for learning - one of warmth, understanding, and support. She can provide the child with learning experiences in which he is successful. She can encourage, praise, and give the child a good opinion of himself. By attending to the child's motivational needs the teacher can be an effective agent in promoting a child's readiness for new work.

Because the degrees of prior learning, maturation and motivation are different in each child, readiness varies in every grade in every activity: printing, art, reading, math, and gym. What does the teacher do to recognize and provide for differences of readiness in children as she teaches her class or develops a curriculum? This chapter will provide a guide by setting forth suggestions, with examples, based on eighteen years of the writer's teaching experience, which will enable the teacher to recognize and provide for readiness in her students.

1. <u>The teacher watches for signs from the child which indicate his readiness for new work.</u> If the teacher is going to respect the readiness level of the student for teaching particular subject matter, she must tune in to the child. She does not say, "Now is the time to start this unit, so tune in, Johnnie!" How do we know when a child is ready to learn? According to Gibson and Ebbeck (1971) "When the child is developing a readiness skill, he usually shows some interest in what he is doing, some deep-seated desire, some feeling of want which needs to be satisfied (p. 125)." If a child is ready to proceed to the next level in a reading series he is highly motivated - he is enthusiastic about starting a new book; he handles his present reader

with ease - an indication that he has adequate prior learning for the next level; he shows no stress or frustration, and is an active participant in his reading group - evidence of sufficient maturity to cope with the next level.

On the other hand, if the child is showing stress, frustration, disinterest, he is getting beyond his depth. For example, Irene was from another province. Behind in the work and not wanting to drop below in grade level, she had much "catching up" to do if she was to fulfil her mother's wishes and pass into the next grade the following year. Highly motivated at first, Irene had no problem absorbing the work as it was presented and her retention was good. But later she began putting her worksheets, unfinished, in the pocket of her coat which hung at the back of the room, instead of bringing them to the teacher for checking. Furthermore, she became habitually late for school, sometimes as much as half an hour, day after day. In addition, she was missing several days because of "pains in her stomach." It was obvious that the child was trying to escape the situation. She was working under pressure and beyond her readiness level. The quality of her work began to deteriorate. Although an intelligent child,

Irene lacked adequate prior learning to begin with. Moving too fast in the program she failed to acquire a firm base as the work became increasingly difficult. The enthusiasm for "catching up" which she originally displayed gradually disappeared. The child was too immature to cope with the heavy workload. When the pressure was relieved and her workload lessened, her attitude improved and learning went on to a fair degree but she never regained the enthusiasm she exhibited for learning at the beginning of the year.

Kevin gave signs that he was working beyond his readiness level when he began playing truant. On parent's day his mother had cried throughout her visit to the classroom because she had been previously advised by the teacher that her child should remain in the grade for another year. Not wishing to upset the mother further, the teacher began pressuring Kevin in hope that he could possibly manage enough learning to enter the next grade the following year. The child appeared to respond to the extra workload without too much difficulty. But eventually he began playing truant. Kevin, caught in a bind between his mother's sensitivity and the teacher's pressuring, chose to escape the situation. If learning turns the child away from school

it serves little purpose. The teacher must watch for signs of readiness from the child.

There is no doubt that Ian is working at his readiness level. He arrived at class one morning starry-eyed and smiling. "I was so happy coming to school this morning that I sang all the way!" Music to his teacher's ear! She knows Ian is working at his readiness level in all areas. He is bouncy and happy throughout the day. When he finishes his assignments he is off to games and puzzles of his own choosing. He plays by himself or with other children who are also enjoying free time. With enough of games and puzzles, he selects a book from the reading table and quietly enjoys a story, or maybe only the pictures. Later he may be seen using the centimetre tape or the scales to satisfy some curiosity. He is always busy in a constructive way. He arrives at his reading group with enthusiasm and is interested in new work as it is presented. In fact, Ian seems to be "just right." He is not in a "top" group and he knows it. But that doesn't bother him. He is a happy and well-adjusted child. Although he has ample potential, to "push" him to work at a higher level would wreck him. Ian's prior learning and maturity are adequate to enable him to cope with the daily work and to manage new

work as it is presented. High motivation enables him to make the utmost use of his prior learning and maturation.

It thus becomes apparent that the child indicates, in his own way, his readiness for new work. The teacher's sensitivity to the child's behavior enables her to determine his readiness level.

2. Achievement tests on finishing a particular unit of work may be a useful tool in enabling a teacher to assess the student's readiness for more advanced material. An achievement test may pick up some weak point, or indicate some strength which the teacher overlooked in the child in the day-to-day routine. But achievement tests must be treated with care. They do not test motivational readiness, an extremely important factor in enabling the child to become an independent worker so that love of learning will lend impetus to his progress. If the child's high rating on an achievement test is due to excessive enthusiasm hitherto experienced, he may not actually be ready for the next unit of work. If he appears to have "had enough" for the time being, if motivation is disappearing, it is wiser to let the child continue working at his present level of

achievement, better to let him "take his breath" for a while than to proceed to more advanced learning. For example, there was one particular child, who, on being called to his reading group, responded with disinterest and indifference. On being asked if he liked reading, he replied with a heavy sigh, "Do you know I went through three readers last year?" He was a bright boy, with above average reading ability, but he had apparently reached the saturation point. It was time to ease off.

Jamie was making excellent progress in the reading program. He had every indication of being able to work comfortably in the next level of the reading series. His achievement tests rated high. He was anxious to go into the next reader, and his mother was anxious that he do so. However, after a few weeks in the new reader Jamie began to appear "tired," fidgety, and disinterested when he came to his reading group. Even though he was in a small group of only three students, and had practically one-to-one attention from the teacher when completing workbook exercises, life for him seemed to become a drag. Finally, he informed the teacher that he found the new book too difficult and he wished to discontinue it. Intellectually, Jamie

was perfectly capable of handling the new book but he was not sufficiently motivated. He, too, had reached his saturation point. According to Greene and Petty (1963) "Psychologically the child can absorb only a certain amount in a given learning period (p. 52)." Jamie continued to read but used books which did not require new learning in the way of vocabulary and phonics. Four months later he again started the book which had been "too difficult." This time he handled it with ease, comfort, and enthusiasm. He also enjoyed the workbook in connection with it and worked with considerable independence. In the four-month intervening period Jamie had matured. His concentration span had increased. He w as anxious for new work as he progressed in the new level, nor did his enthusiasm wane. Jamie had adequate prior learning for more advanced work four months previously, but he lacked the maturity to handle the workload and consequently developed a psychological block which interfered with his motivation.

A child is a good judge of his own readiness. He will give the teacher cues when the work is beyond his level of readiness - if she will but listen. Achievement tests are a useful tool in determining a student's readiness for new work but they must not be used in

isolation. They must be used in conjunction with signs for readiness from the child.

3. Anticipation of moving to a higher level is a good indicator of readiness. A child may be motivationally ready for the next unit of work, even though the teacher feels, and the achievement tests indicate, that he lacks certain skills. In a classroom of three reading groups it is interesting to watch the excitement of some students build as they near completion of a particular reader, with anticipation of moving into the "next" book, particularly one which has been used by a more advanced group in the class. Some children equate a reader with status. To detain these students unduly from progressing to the next unit of work, even though some of their skills are not as well developed as one would desire, could do irreparable damage. Their motivation could disappear. Reading and mathematical skills are repeated over and over as the program progresses. Even if they are not, the teacher can bear in mind the student's particular weak points and attend to them.

Robbie was in a "top" reading group but as the term progressed it became obvious that he would function better in a less advanced group. As the group neared

completion of their present reader, motivation was high for starting the next level. The teacher decided that Robbie should not start the next level until some time later. He would use a less difficult book. Robbie's disappointment in not moving ahead with his group interfered with his learning in general. His motivation diminished. It was apparent that Robbie should return to his original group and use the book which the teacher felt was too difficult for him. As it happened, Robbie progressed nobly. His spirits knew no bounds and motivation propelled his learning throughout the term. Holding a child back until all skills are perfected may interfere with his psychological readiness and result in diminishing returns. Prior learning is important but it must be kept in proper perspective.

4. Timing is important in providing for readiness. No teacher would be so insensitive as to discuss the properties of ice with young children on a day in June, in preference to the "dead" of winter when skating is uppermost in their minds. The phenomenon of the shadow is best dealt with on a sunny day when the children can romp and play outdoors. Creative writing may be facilitated by special occasions such as Halloween, Christmas, and Easter. Ghosts and goblins, Santa Claus,

and the Easter Bunny are very real to young children. Encouraged by the teacher, children will let their imagination run wild on these special occasions and produce exciting and interesting stories.

The class visited the fire station in the morning. They climbed on the trucks, sat inside, blew the sirens, tried on the firemen's hats and boots. They examined the ladders, the hoses, and the respiratory equipment. In the afternoon, during art period, the children painted pictures relating to the fire station and the work of the firemen. The afternoon's work was of high calibre for Grade 1 children. Time was the key to their success. Timing facilitates motivation. Timing can be a stimulus to readiness and the teacher should make optimum use of it.

5. Motivation is a key factor in providing for differences of readiness in children. Teachers must assume considerable responsibility for the student's motivation in learning. According to Haysom and Sutton (1973-74) curriculum designers give less than adequate attention to the element of motivation in curriculum development. However, they point out that motivational criteria may be of little help in designing a course, due to the lack of knowledge pertaining to the students

for whom the course is intended. Therefore, it falls to the classroom teacher to devise ways and means to enable the student to develop a desire to learn. For example, the teacher may arrange visits to museums in order to stimulate in the students an interest in the history of the province. She may set up an aquarium in the classroom to motivate children to research on tropical fish. By displaying an interest in things which the students bring to the classroom - fool's gold, pieces of coal, rocks, tadpoles, dandelions - the teacher can arouse in the children a desire to expand their knowledge of a particular item. By making provision for the students to enact a play, the teacher can create in them an interest in the works of Shakespeare.

It will pay big dividends in the student's readiness to learn if the teacher can get behind the scenes and find out what makes each student tick. In this way the teacher can take up the slack left by the designer in developing curriculum - motivation, to which Haysom and Sutton refer as the neglected component in models for curriculum improvement (p. 23). "The difference between failure and success may lie entirely in the motivation of the learner (p. 26)." Motivation involves needs.

6. Attention to the needs of students is imperative in establishing readiness for learning.

In order that the student derive the greatest benefit from a learning situation, the teacher must discern his particular needs and focus on the reduction of these needs in organizing the learning (Haysom and Sutton, pp. 23-25). "If the student finds his course rewarding in this sense, if what he does in the course diminishes his dominant needs at his particular stage of development, then he will be fully involved (p. 25)." Haysom and Sutton point out that considerable skill is involved on the part of the teacher in presenting what is relevant to the student in a form that meets his needs. "Working on what the course has to offer must give the student a sense of satisfaction and a reduction of tension and anxiety in relation to the preoccupations that dominate his feeling (p. 25)." A student may respond to praise because he has a need to achieve, or if he needs to relate emotionally to the teacher he will endeavour to achieve in order to be praised. Knowing the student's particular need gives the teacher a powerful tool with which to engage the learner's interest and effort. "One student might judge a topic relevant because it meets a need that is dominating his feeling at that time, and

another might think it irrelevant because it relates to needs to which he cannot attend (p. 25)."

In elementary school the teacher generally has the child during the entire day and learning the needs of the individual student presents no great difficulty. Stephen, a middle child in the family, had neither the rights of the older, nor the privileges of the younger brother. Frustrations resulting from his position in the family circle were brought to the classroom and interfered with his learning. To overcome his problem Stephen needed an extra dose of love and attention from the teacher. By having the child sit beside her during story time, help her pass out papers, and run errands to the office the teacher enabled Stephen to develop a sense of importance. In the classroom he had the same rights and privileges as every other child. Here he was not a middle child. The special attention he received from the teacher was the frosting on the cake. Stephen's emotional problems gradually disappeared from the classroom. Consequently, he was able to work at a higher level of readiness. The teacher provided for this child's readiness by attending to his needs. As was mentioned in Chapter lll, the student's emotional needs must be satisfied before he can become

a self-actualized individual.

Chapter 111 also points out that a child's physical needs are the first needs to be supplied before he is ready to learn. Cynthia was a child from the disadvantaged sector of society. Whether it was due to lack of initiative or know-how, her mother had been unable to obtain the services of a dentist to attend to a tooth which was giving Cynthia great discomfort and interfering with her learning. With the consent of the mother, the teacher arranged with her own dentist to attend to Cynthia immediately. A child's physical needs must be attended to before she is ready to learn at all.

Claude was a Grade 8 student in a one-room rural school. He had to take over the farm chores because his father suffered a broken leg. Unable to cope with the morning chores and arrive at school by nine o'clock, the boy decided to temporarily drop out. However, the teacher suggested that he come to school whenever he was ready - ten, eleven o'clock, it didn't matter, but come and do what work he could. Claude took her advice and completed Grade 8 in June with flying colours. By attending to his needs, the teacher enabled the student to enter Grade 9 on schedule. The teacher must be ever mindful of the needs of students - physically,

socially, and emotionally as well as intellectually, in providing for their readiness for learning.

In junior and senior high, where subject teaching is the order of the day and the teacher may be confronted with several classes of thirty-five or more students for approximately forty-five minutes each day, it is more difficult to ascertain the needs of the individual student. Perceiving the needs of the individual student in such cases, and arranging learning experiences accordingly become a major undertaking. Furthermore, to a large extent the needs of students in junior and senior high differ from their needs in elementary school. At these levels students generally relate more to their peers than to their parents or teachers. Students are under peer pressure.

In junior and senior high a teacher may gain an insight into student needs by use of a questionnaire to be completed by each student. He may ascertain the student's social needs by such questions as "Do you prefer group or individual projects?" "Do you prefer small group discussion or teacher-student interaction format for classes?" The teacher may determine a student's need to achieve by asking "What do you consider to be most important in the course - enjoyment of

subject matter, high marks, or a mere credit?" The same questionnaire may be used to ascertain the student's interests, which indirectly give a clue to his needs. A biology student interested in horseback riding will find a project relating to horses highly motivating. In an English class, the interests and needs of a girl who is active in the drama club would be different from those of a boy who devotes his spare time to designing and constructing hotrods.

A wide variety of courses, especially at the high school level, gives students an opportunity to satisfy their needs and interests. However, if a student sees no value in a compulsory course, if he feels strongly that he has no "need" for it, the teacher can influence his readiness by creating a situation which will enable him to develop a need for the subject and thereby become ready for learning. To promote readiness the teacher must start where the learner is, not where he "should be." According to Ausubel (1958)

> ...one of the primary functions of education is to stimulate the development of potentially worthwhile needs. Recognition of the role of needs in learning means that teachers should try to develop needs in pupils for the subject matter they wish to present as well as take cognizance of existing concerns. It does not mean that the curriculum should be restricted

> to the specific interests that happen to be present in a group of children growing up under particular conditions of intellectual and socio-economic stimulation (p. 577).

Many English students do poorly in French courses because they feel they have no real use for the secondary language. In addition, low marks to which they are subjected because they have no "ear" for the language and consequently cannot cope with dictation exercises, leave little or no motivation for learning. A tremendous responsibility rests with the teacher in developing in students a need for subject matter which will, in all probability, affect their lives as citizens of their country. Attending to the needs of students is a critical matter in providing for readiness to learn.

7. Teachers may attend to readiness levels by grouping. It is reasonable to assume that children who appear ready to begin reading early in the primary grade would form a group separate from those who show no sign of readiness for reading until later in the year. Usually, the younger the child, the later in the year is he ready to begin reading, but there are exceptions. Consequently, in a group of one hundred children there are many reading groups. All these children, except

in rare instances and for very special reasons, will pass into Grade 1 at the end of the school year, in accordance with the philosophy of progressive education. Grouping these children for Grade 1 homogeneously, according to reading ability, for particular classes solves many problems. In a homogeneous class there is an even spread of ability from pupil to pupil. Dividing the class into small groups of similar size, for purposes of instruction, presents no problem. Furthermore, it is easy to regroup these students, for various reasons, throughout the year.

However, grouping children homogeneously presents problems. Social factors enter the picture. If a child is assigned to a particular class because of his reading ability, he becomes labelled top, middle, or bottom as the case may be. Therefore, grouping heterogeneously is often resorted to. With a heterogeneous class the Grade 1 teacher finds herself in somewhat the same situation as the Primary teachers - a wide spread of readiness for reading. So the process starts all over again, and the Grade 1 teacher has reading groups with varying degrees of readiness. The greater the spread of reading ability, the greater the number of groups. Naturally, there is a limit to the

number of groups which can be efficiently accommodated in a single classroom. But it is not uncommon for a teacher in the early grades to have three distinct reading groups.

It must be noted that a particular number of reading groups does not necessarily mean an equal number of groups in math, science, health, or social studies. Even though their ability in reading may be fairly widespread, children within a particular age limit display interest in many of the same things. Every child at the age of six or seven enjoys, and derives a great deal of benefit from a trip to the fire station or the museum. If children are given an opportunity to paint pictures depicting information they acquired during their visit to the fire station, one would not be able to match picture to reader, on the basis of superior, or even what we might consider "good" work. It often follows that a less advanced reader will turn out something of higher calibre in the way of art to that of a peer whose ability in reading is considerably superior. If children are encouraged to bring story books from home about fire engines, or any topic that is being focused upon, the less advanced reader may proudly present something from his personal "library" as soon as the precocious

reader. The element of participation is inherent in all children and can be used to advantage in unifying a class with variations of readiness levels. Grade 1 children, regardless of readiness level, enjoy listening to the same story read by the teacher. It gives them a sense of cohesion, a communication with one another, especially if they all sit in a group on the floor. Interestingly enough, a child who could easily read the story to himself, or even to the class, enjoys listening with the other children while the teacher reads.

A reading program involves the mastery of many skills. But three reading groups do not necessarily mean three phonics groups. Children have their strong and weak points in phonics, and members of different groups can unite for instruction in particular items. Sometimes two or three children from a more advanced reading group will join one of the less advanced groups to strengthen his weak points. As the year progresses, it is noticed that children from a less advanced reading group often display great interest in the work of the more advanced groups. They have a tendency to "listen in," to get a "head start," so to speak. In this way they sometimes advance more rapidly when they

begin a new unit of work than did their more advanced peers who had not been exposed to the prior learning.

8. A teacher needs to be educated in child psychology in order to effectively provide for a child's readiness to learn. According to Logan (1960) it is essential that a teacher have knowledge of the way a child grows. A teacher must recognize individual differences in physical, mental, and emotional growth among children and provide for such differences in the classroom (p. 28). As was pointed out in Chapter II, children do not progress in all areas of development at the same rate, nor is development necessarily dependent upon chronological age. Each child has his own internal timetable which must not be tampered with. Barbara was a precocious reader, but her mathematical ability was not comparable to her reading ability until junior high. Andrew was a bright student but had little control over a pencil until well on in elementary school. Emma moves slowly in the reading program but in story telling her imagination knows no bounds. In addition, she delights in performing before the class. Timmy, a behavior problem, had a degree of ability in art seldom found in young children. Some children just cannot sit still for as long a period of time as others. The

teacher needs education in child psychology so that she will understand the reason for all these "irregularities" in children. She must understand that they are a normal part of the child's development. To force a child to bring his mathematical ability in line with his reading ability, or to try to print as well as another student, is to court disaster. The teacher should keep in mind her need for child psychology in planning for professional development.

9. Discovery learning provides for the various levels of readiness in a group of children. The teacher may provide for several readinss levels in the classroom by allowing the students to resort to discovery learning where it is feasible. In discovery learning, rather than receive information in its final form, the student, through experiment, discovers the knowledge himself. Subject matter in science and mathematics may be efficiently dealt with in this manner. Even very young children will get a good conception of the properties of ice if several blocks of various shapes and sizes are on display throughout the classroom. Children will acquire mathematical concepts if they are free to experiment with equipment designed for the acquisition of particular facts. Furthermore, children can learn at their own rate.

They can "take their time" in absorbing concepts. Discovery learning may be fairly informal or it may be structured and guided, depending on the class and subject matter. If the teacher wishes to teach the properties of ice she may distribute several blocks of various shapes and sizes throughout the classroom and leave the children free to examine and "play" with them at their leisure. The children may be free to interrupt her at any time if they wish to discuss a particular matter or point out an item of interest. With an older grade the teacher may give the students certain objectives to attend to and report their findings in a formal way. In discovery learning "The teaching strategy is usually aimed at placing on the individual the responsibility of transforming information and reassembling it to new insights (Taba, 1963, p. 314)."

Just how much knowledge children assimilate at any one time from various studies and projects will no doubt be proportionate to their readiness levels. But it is not necessary that a child learn "everything" about a particular topic which is being dealt with in order to derive enjoyment and benefit from it. In the early grades, merely being exposed to ideas lays the foundation for more formal and sophisticated learning

in more advanced grades. As was mentioned in Chapter 1, "A quick, light, vivid, active exposure to a new area is the best way to assure that children will come back for more learning (Seagoe, 1970, p. 24)."

According to Beckner and Cornett (1972) the discovery approach to learning gives students an opportunity to develop creativity and divergent thinking. "Also, individual student perception will be given room for growth and expression, providing teachers with the opportunity to better understand individual students and help them gain a better understanding of themselves (p. 142)." According to Frandsen (1957) by discovering in situations which are meaningful to them children learn to work independently, they develop initiative, and they learn to make important choices (p. 420). Discovery learning enables the teacher to provide for various levels of readiness in her class in teaching particular subject matter.

10. <u>Continuity of curriculum enables the teacher to provide for readiness in the students.</u> Teachers need guidance as to where the students are heading. Regardless of grade or readiness level the teacher must see the student in perspective. No one lives in isolation. The individual, with his

characteristics that make him different from everyone else, must operate within a community. The student is always preparing for the next level, the next grade, and finally for leaving the public school system.

The teacher should have an overview of the program of studies. She is not concerned with just the curriculum for a particular grade. She must know the child's previous learning and also what will be reasonably expected of him in the following grade. The teacher may acquire useful knowledge in this regard by consulting parents and other teachers. Merely attending to the student's immediate "needs" and "interests" will not necessarily prepare him to take his place in society. There must be a thread of <u>continuity</u> to the program a student follows from the time he enters the school system until he departs. There must be some overall basic curriculum plan which can serve the teacher as a core and around which activities and studies may vary and centre.

While attending to continuity, curriculum designers must work within a frame of generality, yet be specific enough to serve the needs of the many levels of readiness for particular subject matter in the various grades. But the details of the program must be

the responsibility of the classroom teacher so that she can interpret the curriculum to suit the needs of the particular student and the class in general. According to Durkin (1972) "We need programs that neglect none and nourish all the child's potentialities (p. 32)." Frandsen (1957) believes that "Children can achieve full development and expression of their talents only in a school situation which provides for a wide range and for varied patterns of individual differences (p. 447)." While working out the day-to-day program for her class the teacher must keep the overall curriculum in mind. Continuity of curriculum throughout the student's academic career enables the teacher to keep learning in perspective and thus recognize and provide for readiness in the individual student as she teaches her class.

CHAPTER V

Factors Working Against the Consideration of Readiness

It is inevitable that readiness is sometimes by-passed because certain factors prevent teachers from giving it the attention it warrants in enabling a student to attain success throughout his academic career.

The teacher's effectiveness in raising the readiness level of the student may be proportionate to the size of the class. According to Bernstein (1967) "The very conditions of the classroom situation often make effective education impossible. Large classes reduce the possibility of individual teaching (p. 239)." Children from the disadvantaged sector of society are less prepared to enter the public school system than are children from the more affluent areas and consequently require much more individual attention from the teacher to compensate for their cumulative learning deficit. Bernstein feels that "the lower the status of the pupil the smaller should be the number in the class." He realizes that this could be an expensive proposition but he feels that in the long run it could pay dividends (p. 239). Disadvantaged

children suffer from inadequate linguistic development and unless remedial steps are taken to correct the situation, the condition will gradually worsen. "As the educational process becomes more analytic and relatively abstract at the secondary level the discrepancy between what the pupil can do and what he is called upon to do is painfully revealed (p. 240)."

A single entrance date to the public school system compounds the problem of readiness being given the attention it rightly deserves. In Nova Scotia children whose fifth birthday occurs on or before October 1 may enter the public school system in September of that year. If that birthday occurs one day later, the child must wait another full year before entering the system. Here one can see the great spread of ability which confronts the primary teachers - almost a year's mental and physical growth in some cases. If one adds to this the various ranges of intellectual ability, regardless of age, one can see the many achievement levels there are in, say, a group of one hundred children starting school in September. This spread of ability continues throughout the other grades in the system. Even when this group of one hundred children is divided into three or four classes

one can understand the many levels of achievement in a single classroom. Since effective classroom management requires a limited number of groups, one can see that it is utterly impossible to give attention to every level of readiness in a single child.

The grading system interferes with attention to readiness. In Nova Scotia children generally pass into the following grade at the end of the school year. Grade level is a benchmark of progress. It puts the student in perspective in the system. Since the successful student "grades" every year, the term takes on status. Grading is an event. "School's out!" Congratulations fill the air. Some families celebrate. Children receive gifts - those more fortunate, expensive ones at that. With society placing so much emphasis on grading, it takes little imagination to understand the position of the child who is held back. Furthermore, in our present system, he will have to wait a full year before he receives a ticket to the grading celebrations.

Therefore, teachers are inclined to "push" the child along so that he will not become labelled a failure or a repeater, with the ensuing social connotations. Parents, as well as children, become

very upset over non-grading. Kevin's mother cried throughout her visit to the classroom on parent's day because she had been previously advised that her son should remain in the grade for another year. Teachers are inclined to give the child "extra" help so that he will warrant passing into the next grade because they feel there is always the chance that the child will "blossom out" the following year.

Even when "grading" is not the issue, the once-a-year grading system prevents students from working at their readiness level. In order to "cover" enough material to warrant progression to the next grade on schedule, the student may have to move so quickly for his particular ability that he is prevented from getting the thorough knowledge he could if he were to move at a slower pace. In skimming the surface the student is prevented from getting the firm foundation he should have for future learning.

Finally, parental pressure can interfere with the child working at his readiness level. Some parents tend to live through their children "...hoping somehow to accomplish in the life of their progeny what they, the parents, were unable to. Thus from the day a child enters kindergarten, grades become a mandate; the

report card becomes a status symbol (Strom, 1964-65, p. 207)." Middle-class competition finds its way into the classroom. Parents are anxious that their child be not one or two readers behind the child who lives across the street and who is in the same grade. They want their child to "keep up." Some parents are not satisfied that the child have "Good" on the report card. They want the child to "toe the mark" so that he will rate "Very Good!" By the same token, some parents are not satisfied with "Very Good" but want their offspring to strive for "Excellent." Ambition has its place and is not to be discounted, but carried to excess it can lead to diminishing returns. It can prevent the child from working at his readiness level in all areas of endeavour. Debbie, a bright child with superior reading ability, became almost hysterical when she learned that she had an unusual number of mistakes on a particular math sheet. Realizing that the child was under pressure from her mother, who was excessively ambitious for her children, the teacher agreed not to send home the corrected paper as was the custom. Debbie's great relief told a story. Parental pressure can cause frustration and

worry in the child. It can result in his working beyond his readiness level with the ensuing problems.

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