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1971). Thus, the purpose of this essay is to address (1) the
theoretical framework and its implications for curriculum theory, (2)
the empirical framework and its implications for curriculum theory,
(3) the present status of curriculum theory in relation to these two
frameworks, and (4) further theoretical and/or empirical
investigations to advance curriculum theory. (Author)

TOWARDS THE ADVANCEMENT OF A THEORETICAL AND EMPIRICAL

FRAMEWORK FOR CURRICULUM

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ABSTRACT

The discovery of theory is a major task confronting educators and researchers in many disciplines. More specifically, Eisner (1971) contends that with the exception of four studies, no attempt to systematically study curriculum has been made. Further conceptualizations and empirical investigations in this area are needed. It's apparent that while some conceptual ideas advanced by Tyler, Goodlad and others are necessary, without further conceptualization and empirical tests the development of curriculum as an area of scholarly and artful practice is limited (Eisner, 1971). Thus, the purpose of this essay is to address 1) the theoretical framework and its implications for curriculum theory 2) the empirical framework and its implications for curriculum theory 3) the present status of curriculum theory in relation to these two frameworks and 4) further theoretical and/or empirical investigations to advance curriculum theory.

2

The attempt to close the gap between theoretical and empirical efforts in the field of curriculum is a justifiable, yet difficult endeavor. Glaser and Strauss (1967) contend that the discovery of such "grounded" theory is a major task confronting educators and researchers in many disciplines. More specifically, Eisner (1971) contends that with the exception of four studies, no attempt to systematically study curriculum development has been made. For example, many endeavors are directed at the conceptual aspects of curriculum while the study of processes and empirical investigations are minimized. Thus, it is apparent that while conceptual ideas advanced by Tyler, Goodlad and others are necessary, without further conceptualization and empirical tests the development of the curriculum field as an area of scholarly and artful practice is limited (Eisner, 1971). Thus, the purpose of this essay is to address 1) the theoretical framework and its implications for curriculum theory 2) the empirical framework and its implications for curriculum theory 3) the present status of curriculum theory in relation to these two frameworks and 4) further theoretical and/or empirical investigations to advance curriculum theory.

Theoretical Framework

Scientific knowledge is needed to generate theory, for it is this knowledge which provides a method of organizing or categorizing things, predictions of future occurrences, explanations of past occurrences, a sense of understanding about causes and effects and a potential for controlling such events (Reynolds, 1971). Certainly, this knowledge is useful to educators if they mutually agree to use that knowledge for the achievement of educational goals. However, the use of such knowledge is limited unless educators can begin to understand the steps involved in the development and application of

3

theory to curriculum. Thus, it is necessary to examine the steps which are involved in the development of theory.

The first step is the development of an idea, which allows the educator to posit definitions, statements, and relationships between those statements. More specifically, this idea is expressed in language shared by other educators so that the classification of ideas can begin. For example, these new ideas can be classified as Kuhn paradigms, paradigms and paradigm variations (Reynolds, 1971). To understand the significance of each paradigm, the characteristics of each will be examined.

The Kuhn paradigm represents 1) a radical conceptualization of phenomena (e.g., totally new ways to conceptualize curriculum are stated) 2) new methodologies to support the paradigm (e.g. new methodologies from other disciplines are used to analyze curriculum) 3) new problems to be solved and 4) an explanation for phenomena that couldn't be stated with previous paradigms (Reynolds). Since this paradigm differs from past orientations, the phenomena related to curriculum theory can only be expressed as dramatic or totally new conceptualizations. Thus, paradigms similar to Goodlad, Tyler, and Taba, are not representative of Kuhn paradigms.

The paradigm represents 1) a unique, not radical conceptualization of the phenomena (e.g. an extension of Tyler's rationale is a unique conceptualization) 2) new research strategies, although few dramatic methodologies are used (e.g. the design may be altered) 3) possible suggestions for new research questions (e.g. Duncan and Frymier's systematic study of curriculum) and 4) a new conceptualization which may or may not explain previous events. The difference between a paradigm and a Kuhn paradigm is the degree. For example, theories of cognitive balance and stimulus-response learning are paradigms, whereas Freud's theory of personality and Marx's conception of

society are Kuhn paradigms (Reynolds).

The paradigm variations represent those paradigms which are slight variations of Kuhn paradigms or paradigms. More specifically, paradigm variations posit variations in emphasis or refinement of details. For example, refinement of Duncan and Frymier's (1967) systematic study of curriculum could be considered a paradigm variation. Thus, the use of these paradigm types attempts to describe the first step referred to as the idea. More importantly, this explicit description posited in the paradigm provides other educators with an understanding of the explanation of the phenomena. Once educators understand the explanation, they are more likely to adopt it. However, this is only the first step or generation of an idea. Additionally, concepts and statements are needed to develop the theoretical conceptualization.

Concepts are used to classify the events or things, whereas the statements can provide further explanation and/or prediction of the phenomena. The latter is referred to as a theoretical statement, which may be composed of concrete and/or abstract characteristics. For example, curriculum is an abstract concept. It becomes concrete when it is related to a particular school system, particular group of people, or a particular time. The definition which determines the existence of a theoretical concept in a concrete setting is referred to as an operational definition (Reynolds). However, further prediction, explanation or sense of understanding concerning the phenomena or event is often necessary. For example, one operational definition related to curriculum is limiting. Thus, specific statements which describe relationships between several concepts are created. More specifically, these statements are referred to as existing, associational, causal, relational, deterministic, and probabilistic (Reynolds). An example of a relational statement is: If a

5

person is a member of a school system which supports participative-decision-making among all members, then he/she will be able to indicate and possibly use his/her ideas as they relate to the growth of that órganization. Additionally, deterministic and causal statements can be derived from research in both education and cognate areas on the basis of how they relate to curriculum. It is the organization of several of these statements which can constitute a theory or theories. Depending on the nature of these statements, these theories are referred to as set-of-laws (also known as covering laws or subsumption theory), axiomatic or causal process. Additionally, each of these theories is used to generate information and relationships relevant to the event or phenomena under investigation (e.g. curriculum). To better understand the implications of each theory for curriculum the 1) explanation of each theory 2). Limitations and/or extensions of each theory and 3) relevance of each theory to those engaged in theory development is needed.

To develop a set-of-laws theory, concepts which have operational definitions are used. More specifically, each of the concepts used in the set-of-laws theory is supported by empirical research. For example, the laws of operant behavior can be examined by this type of theory. The examination of these laws of operant-behavior is initiated by reviewing related definitions. For example, definitions related to operant behavior, actual behavior emitted by organism, frequency of behavior, rewards for behavior, relationship between past consequences of behavior, continuous and intermittent reinforcement, learning, and extinction need to be examined (Reynolds). The definitions which are supported by empirical evidence can be used to state the laws of operant behavior. For example, if the relationship between the behavior and the reward is continuous or certain, then the organism will emit the rewarded behavior more quickly than if the relationship is intermittent (Reynolds).

6

Similarly, definitions or relationships which are supported by empirical research and are related to curriculum can be posited to form a set-of-laws theory. For example, there are several empirical investigations in instruction and organizational communication which could be used to develop various aspects of curriculum theory. Thus, scientific knowledge in the form of a set-of-laws appears to be useful for providing classifications, predictions, explanations and control. However, the set-of-laws theory eliminates the use of unmeasurable, hypothetical theoretical concepts. Depending on the phenomena or event under investigation, one may want to use a more flexible theory. A theory which allows such hypothetical statements to be stated is known as axiomatic.

The axiomatic theory is an interrelated set of definitions repre-sented by 1) a set of definitions, inclusive of primitive and derived theore-tical concepts and operational definitions 2) existence statements which describe the scope of conditions applicable to the development of a theory 3) relational statements, such as axioms or propositions and 4) a logical system to relate concepts within statements and derive propositions from axioms or other propositions (Reynolds). Before the propositions can be developed, con-sideration of the axioms is necessary. At least two of these axioms must be supported by empirical evidence, whereas the third axiom can be derived logically. For example, two statements are stated on the basis of empirical evidence. The third statement then follows based on deductive logic. Thus, hypothetical unmeasurable concepts are employed in the development of this type of theory. Additionally, a series of statements may be listed, from which any two state-ments are interrelated, so empirical support tends to provide support for the whole theory rather than one statement, as in the set-of-laws theory. Thus, educators engaged in developing curriculum theory are given more flexibility

with the axiomatic theory. For example, the empirical investigations in organization communication and instructional theory can be used to derive logical propositions. It is these logical statements which often provide new insights for further empirical investigations for the development of curriculum theory. Although the axiomatic theory provides classifications, predictions, explanations, and control, it does not always provide a sense of understanding unless it can be organized as causal descriptions. This sense of understanding is provided by the causal process theory.

The causal process theory is represented by 1) a set of definitions, including primitive and derived theoretical concepts 2) a set of existence statements describing situations in which one or more causal processes are expected to occur and 3) a set of causal statements with deterministic or probabilistic relations describing one or more of the causal processes or identifying the effect of one or more independent or dependent variables. The difference between the causal process theory and the axiomatic theory is that all statements are considered equally and all statements are presented in a different fashion. Additionally, the causal process theory is more advantageous than the set-of-laws or axiomatic based on the use of hypothetical concepts and the provision of a sense of understanding. This provides more efficient research, based on the fact that interrelated statements can be tested. It also allows the theorist to examine the intended and unintended consequences of his/her formulation (Reynolds). The educator using the axio-matic theory with several sets of statements to derive the third logical statement, often begins to find cause-effect relationships, which can be used to generate causal-process theory. To better understand the implications of each theoretical framework, it is necessary to examine the empirical frame-work and how this relates to curriculum theory development.

8

Empirical Framework

Reynolds (1971) contends that the most important criterion for
evaluation of theoretical statements is the degree of correspondence between
statements and empirical results. This evaluation of theoretical statements
can be provided by the use of descriptive and/or inferential statistics.
For example, to measure the attitudes of teachers and administrators towards
various developments in the curriculum field, descriptive statistics (e.g.
a survey) can be used. This estimation of the attitudes of all teachers and
administrators is measured by a representative group or proportion of the
teachers and administrators (randomly selected). Since the use of descriptive
statistics is inexpensive, this analysis can be used extensively throughout
school systems to provide further insights for curriculum theory. To provide
more explicit information, inferential statistics can be used.

Inferential statistics determines which one of the descriptions of
an event or phenomena is the "true" description. To use inferential statistics,
it is necessary to 1) make a statement of research and null hypotheses, which
posit relationships between variables 2) use a randomly selected population
to test the relationships between variables posited in hypotheses 3) develop
an experiment which is characterized by appropriate confidence levels, (e.g.
two-tailed test, alpha level is .01) statistical analysis, and design (e.g.
analysis of variance or regression for more than 2 groups) and 4) provide an
interpretation/discussion of results. Additionally, the use of inferential
statistics is inexpensive and it provides further insights for theory develop-
ment. Thus, the use of inferential statistics in education is advantageous.
Both these descriptive and/or inferential statistics become more meaningful as
the theoretical conceptualizations are constructed. For example, the educator
engaged in advancing such conceptualizations by use of descriptive and/or

inferential statistics begins with positing relationships between statements, which can be stated in the theory-then-research or research-then-theory form.

Theory-then-research involves several components. The theory, either axiomatic or causal process is generated by positing relational statements. One statement which posits the relationships between variables is selected for research purposes. Following data analysis, the comparison between the selected statement and research results determines whether or not changes are needed in the theoretical framework. If the comparison indicates that the theoretical statement is meaningful, then other statements can be tested. As indicated previously, to construct meaningful theoretical state-- ments is difficult and time consuming. For example, a series of statements posited in the axiomatic-theory form followed by selection of three of those statements, the third being derived logically, is time consuming and difficult. To alleviate such problems, the research-then-theory form may be employed.

Research-then-theory also involves several components. First, the event or phenomena is selected, followed by measurement of all the characteris- tics of the phenomena or event in several situations. In some cases, the research may already be done. For example, research for educators can also be found in cognate areas, such as communication or psychology. Since several phenomena have already been studied in these areas, replication of studies which are relevant to appropriate theoretical conceptualization can be eliminated. Following this, the data is analyzed for systematic patterns to specify which statements are related to the development of a set-of-laws theory. Additionally, there are several statistical procedures such as factor analysis which deter- mine which variables go together in different situations. Thus, the research necessary to develop a set-of-laws theory can often be agreed upon in the early stages of experimentation, rather than in the later stages. At this point,

the need to develop both theoretical and empirical frameworks for curriculum is apparent. To better understand the nature of curriculum today and in the future 1) the present status of curriculum theory in relation to theoretical and empirical frameworks and 2) further theoretical and/or empirical investigations to advance curriculum theory will be considered.

Present Status of Curriculum Theory in Relation to Theoretical and Empirical Frameworks

Although attempts have been made to develop curriculum from theoretical and empirical frameworks, further knowledge is needed to advance curriculum theory. For example, Beauchamp and Beauchamp (1972) contend that curriculum in professional education carries the largest number of diverse meanings, which accounts for the communication about it being severely handicapped. Thus, the advancement of curriculum theory is dependent upon 1) reconceptualizing and/or advancing present efforts which address both theoretical and empirical frameworks related to curriculum and 2) advancing new theoretical and empirical frameworks (as indicated throughout the previous sections). To better understand the implications of these two concerns, each will be considered in detail.

The first concern, reconceptualizing and/or advancing present efforts which address both theoretical and empirical frameworks related to curriculum, can be considered by analyzing those contributors who have advanced such ideas, namely, Duncan, Frymier, Eisner, Beauchamp, Johnson and others.

Duncan and Frymier (1967) advance a systematic study of curriculum by proposing basic ingredients of the curriculum which they refer to as actors, artifacts and operations. Each of these ingredients are defined as they relate to the "curriculum molecule." More specifically, this curriculum

11

molecule designates temporal relationships. Similarly, Duncan and Frymier (1967) propose a classification of events related to instruction, but in the context of curriculum. Each classification was examined in a pilot study to determine the extensions and/or limitations of their classifications and definitions. Thus, the basis of their analysis provided further insights of the usefulness, adequacy, and appropriateness of their descriptive statements. Similarly, Duncan and Frymier (1967) posit the need to assess descriptive statements or categories before prescriptive approaches become useful. If educators know precisely how many specific facts, how many concepts, and how many causal relationships are contained within a particular piece of curriculum, they would probably be able to prescribe certain curricular events as more appropriate (Duncan and Frymier, 1967). Certainly, their systematic study of curriculum provides the initial steps for further development of a theoretical and empirical framework for curriculum theory.

Eisner (1971) contends that while some conceptual ideas have been advanced by many educators, empirical tests are lacking. Furthermore, he contends that both further conceptualization and empirical tests are needed to advance curriculum as an area of scholarly study and artful practice (Eisner, 1971). Thus, the contributing authors in his book, Confronting Curricular Reform attempt to address these limitations. For example, mastery learning and its implications for curriculum development, science curriculum development, and art curriculum development are considered. More specifically, Bloom (Eisner, 1971) posits 1) the need for research to determine how individual differences in learners are related to variations of the quality of instruction and 2) that subjects which are required, sequential, closed and emphasize convergent think should employ mastery learning strategies. Thus, according to his contentions, curriculum developers and/or theorizers should be concerned

about what is truly sequential in learning and why. Similarly, other authors posit ideas and their implications for curriculum theory although they do not offer as many descriptive categories and/or spatial and temporal dimensions. However, many useful insights for further theoretical and empirical frameworks can be developed from these contributing authors.

In Comparative Analysis of Curriculum Systems, Beauchamp and Beauchamp (1972) address the nature of curriculum systems in different countries in terms of their similarities and differences. To accomplish this, they posit several definitions which are relevant to their study. More specifically, these definitions are 1) curriculum-product of curriculum planning 2) curriculum design-what it looks like, what it contains, how the contents are arranged 3) curriculum decision-making and action systems-related to curriculum functions 4) curriculum engineering-curriculum system and internal dynamics 5) arena-where planning takes place 6) involvement-those engaged in planning activities 7) implementation-work processes relevant to planners and 8) evaluation-evidence of success of curriculum (Beauchamp and Beauchamp, 1972). Such systemization is necessary to denote the "effectiveness" of each system. Before prescription can occur, systemization provided by descriptive definitions and statements is needed (Duncan and Frymier, 1967). It is these descriptive definitions and statements which lead to further conceptualization. For example, Beauchamp and Beauchamp (1972) contend that both conceptualization and relation-ships of the fundamental systems and schooling operations are necessary if curriculum theory is to advance. Thus, the task of theory building is to define constructs and establish their relationships, no matter what different constructs are used. The next task is to apply intense research processes to the theoretical and practical problems of curriculum (Beauchamp and Beauchamp, 1972).

Beauchamp (1975) contends that the initial task confronting educators
is to define curriculum theory. More specifically, he posits that definitions
are needed since a systematic classification is still lacking, although some
classification of knowledge has occurred (Beauchamp, 1975). To enhance this
classification process, he provides statements, research, models and theoreti-
cal implications for curriculum. For example, he proposes a study using
randomly selected teachers and relating the effects of various types of in-
service training upon the teachers ability to participate as curriculum
planners. Beauchamp (1975) contends that the results enable the researcher
to infer similar generalizations for other similarly chosen groups and their
parent population. Not only does he establish the need and explanation of an
empirical framework for curriculum and approaches concerning its usage, but
he also considers the theoretical framework. Thus, like other theorists
in behavioral science, the curriculum theorist is subject to 1) establishment
of descriptive and prescriptive definitions for technical terms 2) classifica-
tion of new and existing knowledge 3) inferential and predictive research and
4) sub-theory development and development of models (Beauchamp, 1975).
Failure to address these concerns augments the problems related to curriculum·
theory. Similarly, Beauchamp (1975) posits that the chaotic state of curriculum
research can be attributed to the lack of theory. Thus, the need for both
theoretical and empirical frameworks is essential, if curriculum is to be
guided by more than trial-and-error approaches. To insure that curriculum
theory may be guided by rational explanations, rather than trial-and-error
approaches, several curriculum theories which are derived from different
definitions, structures, and propositions are needed (Beauchamp, 1975).

Johnson (1968) contends that educators are concerned with improvement
rather than understanding educational phenomena. Following this contention,

he addresses this issue of understanding by defining curriculum and its relationship to instruction. More specifically, curriculum is defined as a structured series of intended learning outcomes (Johnson, 1968). Furthermore, he posits that the order of these learning experiences is influenced by the curriculum structure, which is related to both a temporal sequence and hierarchical relationships among items (Johnson). To see how these ideas relate to further theoretical conceptualization, extensions and/or limitations of the curriculum source and structure and the selection of curriculum items are considered. Further consideration of his model which represents curriculum as an "output" of the curriculum development system and an "input" into the instructional system and his schema which specifies corollaries is extremely useful for further development of theoretical and empirical frameworks for curriculum. Certainly, each of these educators has made a laudable attempt to advance further theoretical and empirical frameworks related to the development of curriculum theory. However, much more knowledge is needed to advance curriculum theory. Thus, the latter part of this essay is devoted to the second concern, further theoretical and empirical investigations which could advance curriculum theory.

Further Theoretical and Empirical Investigations to Advance Curriculum Theory

Although these laudable attempts to generate curriculum theory have been made, the need to advance further empirical and theoretical frameworks is essential. If further investigation is not pursued, the reliance on common sense and personal judgment will be the only basis for explanations of phenomena and decisions concerning humans. Reynolds (1971) contends that the inadequacy of common sense alone as an explanation of a phenomena or event should be apparent by now. More importantly, its failure as a foundation for decision-making is demonstrated repeatedly (Reynolds, 1971).

Further empirical and theoretical frameworks which advance curriculum
theory can be derived from 1) extensions of the ideas posited by the theorists
in this essay and 2) new set-of-laws, axiomatic or causal process theories
which posit new topologies or classifications which provide explanations,
predictions, control, and/or a sense of understanding. To better understand
these two concerns, examples will be considered.

In Duncan and Frymier's (1967) systematic study of curriculum, new
or additional insights concerning their classifications and descriptive
statements can be provided if a research-then-theory strategy is employed.
The assessment of the generalizability of their classifications and relational
statements can follow, for it is this strategy which enables one to measure
all the characteristics of the phenomena or event in several situations.
Certainly, this strategy which is employed to examine and advance the empirical
framework can provide further insights for more systematic studies. Similarly,
a more extensive empirical base is needed to advance Bloom's (1968) ideas
concerning mastery learning. To accomplish this, investigations of 1)
individual differences in learners and how those differences are related to
diversity of the quality of instruction and 2) student abilities as they inter-
act with both the instructional materials and instructor's abilities in teaching
are needed. Additionally, Bloom (1968) contends that these ideas merit the
attention of curriculum developers and theorists. More specifically, he
states that what is truly sequential in learning and why is an important
consideration in curriculum. Certainly, the development of further empirical
investigations in these areas can begin to assess the relevant points of
concern for curriculum theorists, developers, and researchers.

Johnson (1968) identifies several corollaries and ideas which are
useful for the advancement of further theoretical and empirical frameworks.

More specifically, he identifies the curriculum as a series of intended learning outcomes (Johnson, 1968). These learning outcomes are categorized into three classes, namely, knowledge, techniques, and values. These broad classes are refined into subsets indicating specific definitions which could be used to develop relational or associational statements. These relational statements are useful to both the theorist and researcher, for they provide new insights for the development of each framework. Thus, several extensions of the ideas posited by these theorists can be useful for further developments in curriculum theory. To better understand the second concern related to the advancement of curriculum theory, examples of new theoretical and empirical frameworks will be considered.

To advance further empirical and theoretical frameworks for curriculum, educators can consider cognate areas for 1) new ideas related to theory development 2) support for those ideas which have little or no support in education, but have been pursued in other disciplines and 3) development of axiomatic or causal process forms of theory to generate more information. For example, several theorists in the social sciences have advanced ideas which pertain to theory construction in general (Reynolds, 1971; Blalock, 1969; Glaser and Strauss, 1967). More specifically, these ideas are both relevant and applicable to general education. Thus, a subset of general education such as curriculum can use these ideas to advance specific theories. Since specific theory construction is tedious, a general framework for theory construction is extremely useful. Additionally, the optimal growth of curriculum can become a reality.

Several ideas which receive little or no support or attention in education are often found in cognate areas such as psychology, communication, and sociology. Similarly, methodologies in these areas are 1) often more

advanced than education and could provide new insights for analysis of relevant

phenomena or events 2) new ways of observing, recording and/or analyzing data,

phenomena or events (e.g. Bayesian statistics, ethnomethodology) and 3)

necessary to the consistent development of an area (e.g. curriculum). For

example, Haysom and Sutton (1974) contend that the motivation of students is

of crucial importance, yet in curriculum more attention is given to objectives

than how to engage the interest and effort of the student. Given their con-

tentions, the information needed to support further theoretical and empirical

investigations concerned with motivation is attained from cognate areas. For

example, the development of an axiomatic theory of motivation begins initially

with several law statements from which the third statement is derived logically.

However, the initial statements which are supported empirically would probably

be found in cognate areas. Certainly, the development of an axiomatic theory

of motivation not only could provide new insights into the phenomena itself,

but also could provide an assessment of the importance of it for curriculum

concerns. Similarly, other diversified contentions posited by educators

engaged in the advancement of curriculum theory can be assessed. Thus, the

dependency solely on the education area minimizes the growth of curriculum

theory.

Lastly, the development of axiomatic or causal process theories to

advance curriculum is essential. More specifically, since the systematic

study of curriculum is necessary to this advancement, these theories are

applicable. More importantly, these theories are flexible, for they employ

1) hypothetical unmeasurable concepts and 2) a sense of understanding (Reynolds,

1971). To employ these ideas, the curriculum theorist generates a series of

statements concerning the phenomena or event he/she is concerned with.

These series of statements are supported by empirical investigations in education, psychology or other cognate areas. Then he/she examines combinations of these statements. For example, two statements (empirically-based) are combined to form a third statement which is derived logically. More specifically, statement 1 = If A, then B and statement 2 = If X, then Y therefore statement 3 = If A, then Y. Given that the theorist found ten statements, the combinations which are used to derive the third statement could vary (e.g. statement 2 and 6, rather than 1 and 2). Certainly, this type of deduction provides new insights for empirical investigations. The variables in the relationships are also more apt to provide clearer and more representative insights than the research-then-theory strategy. Similarly, the causal-process theory provides new insights of relationships between variables which can be assessed as probabilistic and/or deterministic statements. Thus, the flexibility of both theories can augment our sense of understanding.

Walker (1973) contends that to develop and sustain the curriculum field, educators need to reverse some of the trends of the past decades. Certainly, consistent efforts and attempts to generate further empirical and theoretical frameworks for curriculum theory can reverse the trend of this decade.

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