Quality Education through a Post-modern Curriculum

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This paper seeks to present a framework for the school curriculum in the twenty-first century. It first describes and appraises critically the Tyler rationale, which has been influential for many decades. The rationale forms the basis of the school curriculum in many eastern and western countries. Next, the concept and features of modernism which underpin the rationale are described, leading to a discussion of its major strengths and weaknesses.

The paper goes on to present an alternative view of the curriculum - Doll's Model, which better meets the challenges of the fast changing world. The model, with its prominent nature of postmodernism, is discussed. Strengths and weaknesses of the model are also analysed. The author also makes a comparison of the two models, explaining why the latter is preferable to the first in laying the foundation of school curriculum in the coming century.

In the concluding section, recent curriculum initiatives in Hong Kong are described. There is discussion on the merits and limitations of The Target Oriented Curriculum. Then the new curriculum framework and its features are described leading to discussion on the implications for the Hong Kong curriculum. It is stressed that key concepts of postmodernism need to be taken into consideration so that the quality of education can be improved.

Key words: curriculum; modernism; postmodernism; open systems; self-organisation; transformation; higher order thinking skills

INTRODUCTION

There are many conceptions of the school curriculum, and therefore many views of what it should be for and what it should contain. This paper will characterise two such interpretations and evaluate them.

Definition of curriculum

The word "curriculum" comes from the Latin word "currere" which means "a course to be run". Many scholars have given curriculum a variety of definitions depending on whether they view it as a plan, an educational programme, learning experiences, actual occurrences, effects or others. Tanner and Tanner (1975) holds the view that curriculum means planned instructional experience designed to help learners develop and extend individual capability. This takes place in schools and is the result of the reconstruction of learners' knowledge and experiences. Grundy (1987) regards curriculum as a cultural and social construction and a way of organising a set of human practices. The variety of definitions indicates that the word "curriculum" involves complex concepts and ideologies. Generally, it includes a consideration of the purposes of education, the content of teaching, teaching approaches with the focus being on the product as well as the process and a programme of evaluation of the outcomes. The study of curriculum is interrelated

to the study of education and it cannot be divorced from many other disciplines such as psychology, philosophy, sociology and ideology.

Philosophical bases for curriculum and instruction

John Dewey (1938) viewed education from another perspective. He points out that philosophy is the general principle of education and that education is the laboratory of education. Philosophy plays an important role in deciding the aims of education, teaching content and organisation. Hence, its impact on curriculum design cannot be over-emphasised. Dewey stresses that education should equip children with the ability to solve social problems to promote their growth. It is important that they develop continuously to meet the ever-increasing challenges of the world. In accordance with this, Dewey deems it necessary to design a curriculum based on children's experiences and let children be involved in interesting and challenging problems.

How these views are interpreted can be seen in the two different conceptions of curriculum discussed here - the modernist and post-modernist conceptions.

MODERNISM AND POST-MODERNISM

This section deals with the concepts of modernism and post-modernism and their features. Their philosophies have, indeed, a strong impact on the design of the school curriculum, leading to far- reaching consequences.

Modernity

Clear conceptions of modernism and post-modernism are important for addressing contemporary curriculum analysis. Doll's work (1993) provides a thorough introduction to this field. Bell (1976) traces the roots of modernity back to Newton and Enlightenment thought. The scientific cosmology of Newton provided "faith in the homogeneity of the universe and its systematic, rational order." Harty Levin (1966) says that in the fifty-year period 1890-1940, modernism produced "the most remarkable constellation of genius in the history of the west".

Hargreaves (1994) gave a description of the features of modernity. He asserts that modernity is a social condition both driven and sustained by Enlightenment beliefs in rational scientific progress. Politically, modernity typically concentrates control at the centre with regard to decision-making, social welfare and education, and, ultimately, economic intervention and regulation as well.

Hargreaves pinpoints the undesirable effects of modernity on school education. Organizationally, the politics and economics of modernity have had significant and systematic effects on institutional life, including schooling. Most of today's secondary schools are quintessentially modernistic institutions. Secondary schools have struggled hard to improve opportunity and choice for swelling numbers of young people, but at significant cost. There has been a cost of impersonality and alienation for their students, and bureaucratic inflexibility and unresponsiveness to change among their staffs. Personally, the effects of modernistic bureaucracies extend through to the formation and fulfilment of individual selves and identities.

Furthermore, narrowness of vision, inflexible decision-making, unwieldy structures, linear planning, unresponsiveness to changing client needs, the sacrifice of human emotion for clinical efficiency and the loss of meaningful senses of community have all become increasingly apparent and worrying features of the later stages of

modernity.

He argues that "many facets of modernity are clearly in retreat or under review - standardization, centralization, mass production and mass consumption among them". He stresses that modernity is not only problematic but is in a crisis state.

Doll (1993) asserts that modernism as an all-encompassing intellectual movement has outlived its usefulness, yet its influence on curriculum practice is still profound. We are in a new stage of intellectual, political, social development. It is time to do more than reform our methods and practices. It is time to question the modernist assumptions and develop a new prospective that simultaneously rejects, transforms and preserves that which has been. In curriculum terms, the managed, mechanistic, large-scale, predictable, behavioristic, objectives-driven and dehumanized modernistic bureaucratic curriculum is characterized by the Tylerian rationale which will be discussed later in this paper.

Post-modernity

We are moving from a modernist world and a modernist conception of the world to a post-modern world and a postmodernist conception of the world. There are no fixity, stability and absolutes. Major changes have taken place in recent times [1] . Jencks (1987) remarks that post-modernism looks to the past ; at the same time, it transcends the past. The new is built on the old and the future is a transformation of the past. Post-modern art and architecture are thus double-coded, indicating a present entwined with its past and future. Post-modernism has an eclectic nature. It is important to "choose and combine traditions selectively … eclect those aspects from past and present which appear most relevant for the job at hand". Pluralism is a feature of post-modernism. Educationally, the art of creating and choosing is more important than ordering and following. Much of the curriculum to date has trained people to be passive receivers of preordained "truths", not active creators of knowledge. Another feature of the post-modern, as pointed out by Jencks, is the concept of multilayers of interpretation. The post-modern looks to the past in order to code past remnants within a future vision.

Doll argues that the educational views of Dewey, Piaget and Bruner are better understood from a post-modern perspective. Dewey's concepts of experience and transaction, Piaget's of development and reequilibration, and Bruner's of learning and thought blossom more fully and richly in a post-modern milieu.

Because change is exponential, it is not possible to say with certainty what the citizens of the twenty-first century will need from their schools. The aims, objectives, content, pedagogy, evaluation and direction of the curriculum are not fixed, but fluid.

Doll stresses that one of the educational challenges in the post-modern mode is to design a curriculum that both accommodates and stretches, a curriculum that has the essential tension between disequilibrium and equilibrium so that a new, more comprehensive and transformative re-equilibrium emerges.

Theories of Chaos and Complexity

Another feature of postmodernism is the celebration of disparateness and chaos. In the present world where change and uncertainty, unpredictability and instability prevail, there is an ever-increasing need for self-organization and adaptability. Recent theories of chaos and complexity are potent reminders of the need for a paradigm shift in the way

we view the world, from a stable world-order to an ever-changing, unfixed scenario.

Laplacian and Newtonian theories of a deterministic modernistically viewed universe are characterized by predictability, patterning, linearity, causality, stability and objectivity. They contributed to the view of the universe as an ordered mechanism, a closed and deterministic system susceptible to scientific laws. Their link with modernity is evident, for both are premised on the same principles of progress.

Since the 1960s, such theories have been increasingly challenged with the rise of theories of chaos and complexity imbued with the spirit of change, uncertainty, openness and unpredictability and some thought-provoking principles [2]. More recently, theories of chaos have been extended to complexity theory. Morrison (1997b) argues that order is not totally predetermined and fixed but that the universe is creative, emergent (through iteration, learning and recursion), evolutionary and changing, transformative and turbulent. Order emerges in complex systems that are founded on simple rules for interacting organisms. Systems, however defined, are complex, unstable, emergent, adaptive, dynamical and changing. It is the emphasis on nonequilibrium that brings order out of chaos. Change, uncertainty, openness are the order of the day and that a premium is placed on organizations (and self-organizations) that can respond to, live with, cope with and lead change. It is apparent that postmodernism, chaos theory and complexity theory are inseparable from one another.

TYLER'S MODEL AND ITS CRITICAL APPRAISAL

Tyler's book, Basic Principles of Curriculum and Instruction (1949) raised four questions:

1. What educational purposes should the school seek to attain?
2. How can learning experiences be selected to be useful in attaining these objectives?
3. How can these educational experiences be organised for effective instruction?
4. How can the effectiveness of learning experiences be evaluated?

Schubert (1986) considers the book one of the most influential books on curriculum thought and practice. The predetermination of objectives, the selection and organisation of experiences to reflect those objectives, followed by evaluations to determine whether the objectives have been attained, appear to place prime emphasis on the choice of goals. It can be seen that this is a modernist view. It provides a scientific model of learning, aiming at quality control. The procedures of designing and developing the curriculum are systematic and rational.

Selection of educational purposes

Tyler states that the selection of objectives is not only the first act that must be done in curriculum planning but the key to the whole process. These objectives are based on the needs of children, needs of society and the thoughts of experts. They are also the product of educational philosophy and psychology. In selecting a group of a few highly important, consistent objectives, it is necessary to screen the heterogeneous collection of objectives so as to eliminate the unimportant and the contradictory ones. The screen is based on the educational and social philosophy and psychological principles to which the school is committed.

Furthermore, the consideration of the sequence of development is conducive to effective learning. Equally important is the awareness of the conditions requisite for the learning of certain types of objectives. A psychology of

learning not only includes specific findings but it also involves a unified formulation of a theory of learning that promotes the learning process.

The Tyler Model is typical of modernism in that it places an emphasis on a mechanistic, prescribed, instrumentalistic, behavioristic, and predictable curriculum. It is mainly performance-based and behaviourist focused. Its high degree of prescription gives people sense of security and promotes standardisation. These are essential features of modernism and emphasize the "managerialist" roots of the Tyler rationale - an attempt to "manage" a curriculum for mass schooling.

Selection of educational experiences

In planning an educational program to attain given objectives, we have to decide on the particular learning experiences to be provided. There are three general principles for selecting such experiences [3]: giving learners opportunity to practise, ensuring learner satisfaction, giving learners appropriate learning experiences in sufficient variety to attain various outcomes.

Organisation of learning experiences

In order for educational experiences to produce a cumulative effect, they must be so organised as to reinforce each other. Organisation greatly influences the efficiency of instruction which is a major feature of modernism - the desire for efficiency. There are three major criteria for effective organisation [4], namely continuity, sequence and integration.

Evaluation of learning experiences

Evaluation is the process of finding out how far the learning experiences as developed and organised are actually producing the desired results and the process of evaluation involves identifying the strengths and weaknesses of the plans. Consequently, we will know in what respects the curriculum is effective and in what respects it needs improvement. Since education objectives are essentially changes in the behaviour patterns of the student, evaluation must appraise the behaviour of students. The process of evaluation begins with the objectives of the educational program. Evaluation procedures give evidence about the behaviour implied by each of the major objectives. It is necessary to construct evaluation instruments for a particular objective. They must meet the criteria of validity and reliability. The results of an evaluation will be analysed to indicate the various strengths and weaknesses of the curriculum.

It can be seen from the procedure that the Model is highly prescriptive, exercising great control over teachers and students. This has the undesirable effect of making them very passive. The Model lays emphasis on outcome, performance and behaviourism, and products that can be measured, controlled and managed. The significance of process is neglected. The Model is sympathetic to modernist attempts to standardise, control and build out human weaknesses or differences. Tyler's Model is universal and uniform and that is its greatest strength and its greatest weakness. It is the archetypal modernist curriculum.

Strengths of Tyler's Model

Tyler's Model is characteristic of modernism which has a lot of strengths with regard to clarity, simplicity, usefulness, practicability, comprehensiveness and focus on specific areas. Tyler's Model is considered effective in curriculum design because it gives a complete paradigm with all the major considerations. The questions posed have a wide, long-lasting and popular appeal.   The model is highly structured and systematic. It is also an appropriate system for large-scale mass education and good for the basics. It is performance based, behaviourist and outcome focused. Standards are set and the learning objectives are measurable. It is a closed system which is easy to follow. The model is sympathetic to the scientific positivist mentality that underpins the modernist conceptions of society - everything is predictable, ordered, measurable, objective and scientific. Rationality rules!

Tyler put into practice the theories of many other educationalists such as Dewey. The framework he proposes is comprehensive, including all the major elements. At the same time, it is simple and easy to understand. It is not built on theories alone as pointed out by Hlebowitsh (1995) [5] . Furthermore, the evaluative system suggested by Tyler is one of the earliest theories in the field. The evaluative procedures are systematic and effective in judging the effectiveness of the curriculum and serve an important guideline for curriculum planners. His contributions are still recognised in the field of educational researches nowadays. Tyler's rationale is a practical theory that is likely to improve any school curriculum. It has laid a due emphasis on the consideration of psychology, philosophy, and theories of learning. Tyler suggests that curriculum planning could start with the existing problems and needs and the rationale could be used at any point with these emergent conditions.

Hlebowitsh (1995) remarks that the rationale is a framework that re-orchestrates key sources, determinants and questions that other progressive-experimentalists championed. The four questions raised by the Rationale correspond to the reflective nature of the problem method that Dewey discussed for educational inquiry. There is a broad and cautious quality to the rationale that the school can benefit from a problem-focused framework that provides a solid ground for the exercise of classroom intelligence and artistry.   It gives an overall shape and direction to the schools, not only in adjudicating what knowledge, experiences and values are most worthwhile for the schools of democracy but also in making decisions over schedule of time and space.

Tyler's Model is also an appropriate system for large-scale mass education and good for the basics. It is a closed system which gives progressive completion to aims. It represents the progressive-experimentalist's commitment to testing ideas in practice to founding judgements in key psycho-philosophical sources, and formulating curriculum problems and solutions based on a reflective method.

Criticisms of the Tyler's Model

In the previous section, features of modernism have been discussed. In contrast with postmodernism, modernism has a lot of undesirable characteristics. Tyler's model, being modernistic, is criticised for being mechanistic, remote from reality, closed, out-dated, behaviouristic, and prescriptive.

William E. Doll (1993) makes a critical analysis of Tyler's Rationale in his book "A Post-modern Perspective on Curriculum". He regards it as a modernist, linear and cause-effect framework. The process becomes *de facto* the implementation and evaluation of pre-set ends. Such a view of process is severely limited. Tyler's four foci are but a variation on Descartes' general method for "rightly conducting reason and seeking truth in the sciences". Learning, in

both these models, is limited to the discovery of the existent, the already known. In the closed system, there can be a transmission of information but not a transformation of knowledge. Descartes is highly committed to mechanism and considers it an extension of his faith in mathematics, producing the certainty he seeks. His mechanistic methodology permeates modernist epistemology and is evident at both subtle and overt levels in contemporary curriculum instruction. The mechanistic model is characteristic of the Tyler Rationale. Classroom pedagogy possibly does not question assumptions and beliefs; rather, it may begin with what is self-evident and moves in linear links to reinforce, establish, or prove that already set and valued.

Doll (1993) remarks that Tyler places prime emphasis on the choice of goals. Being pre-selected, objectives as ends are elevated beyond or made external to the process itself. Tyler talks of "an acceptable educational philosophy", which acts as a screen in the selection of objectives. However, as Kliebard (1995) points out, Tyler does not elaborate on the criteria of this screen. There also lies a basic value difference between John Dewey and Ralph Tyler. Dewey sees educational ends arising within the process of experiential activity, with learning as a by-product of that activity while Tyler sees educational ends set prior to experience, with learning a specifically intended, directed, and controlled outcome - one that can be measured. The difference is seen more clearly when curriculum is looked at from a post-modern perspective.

For educational goals, Tyler turns to Bobbit's (1924) notion of framing these in terms of the practical and professional work needs of contemporary society. Like Bobbit, he talks of "needs" as "gaps to be overcome" and he uses contemporary standards as the basis for these needs or gaps. Needs tacitly assume a stable-state universe wherein the oughts are agreed to, categorised and measured. The concept of standardised norms lying within a stable-state universe lies at the very heart of the modernist paradigm. It is also a concept the post-modernist paradigm, in all its variations, challenges, and rejects.

Ted Aoki (1983) carries this concept of instrumentality in the Tyler rationale even further. He points out that the "scientific" tradition in curriculum is really a utilitarian orientation rooted in interest for "intellectual and technical control of the world". The roots lie partly in modernism's fear of uncertainty, and its utopian vision of a better world through order and control. Jacob Bronowski (1978) warns that "Cause and effect has taken powerful hold on our minds" that "we have the greatest difficulty in freeing ourselves from its compulsion". He adds that "Nature is not strictly a succession of causes and effects". Embedded within nature is the powerful force of creation, of spontaneous action, of self-organisation - examples of complexity and chaos theories We need to use the message of post-modern science if curriculum is to enter a new era.

Tyler's mention of the use of the philosophical and psychological screens has given rise to great controversy. Hlebowitsh (1995) comments that the Tyler Rationale acts as a device to legitimate the role of behaviourism and narrow specificity in curricular thinking. Tyler's Model is undesirable as a complete model for the design of curriculum in education. It tends to cast students in a passive mode, emphasising control and understanding rather than empowerment. It also tends to trivialise the curriculum to the easily measurable, that is addressing lower order behaviours rather than higher order thinking. It also reduces the complexity of the curriculum to simplistic statements. Finally, it exerts a constraining influence on individual empowerment, emancipation and freedom which is the characteristic of post-modernism.

It is useful to compare Tyler's Model with Habermas's (1981) Technical Model of the curriculum [6]. They have features in common and have important implications for the design of curriculum.

DOLL'S MODEL AS AN ALTERNATIVE VIEW

Tyler's Rationale is characteristic of a modernist, scientific, managerialist mentality of society and education that regards ideology and power as unproblematic. Doll argues that it is firmly rooted in Taylor's view of "scientific management". Taylor believes that pre-ordering of tasks by managers for workers is "the most prominent single element in modern scientific management". This has been incorporated into the design of curriculum by many curriculum developers. It is assumed that ends should be fixed prior to the implementation of means. Efficiency is measured in terms of the number of specific ends achieved and the time needed for achievement.

Doll (1993) criticises Tyler's Rationale for its linear ordering of the sequence: pre-set goals, selection, and direction of experiences, evaluation and its dichotomous separation of ends from means and the instrumentalist or functionalist view of the nature of education. Furthermore, its closed system of planning and practice is inconsistent with the notion of education as an opening process and with the view of post-modern society as open and diverse, multidimensional, fluid and with power more problematical. This view takes seriously the impact of chaos and complexity theory and derives from them some important features for contemporary curricula.

Features of Doll's Post-modern Model

Doll's philosophy of education is reflected by his pedagogic creed which stresses the concept of reflection. Doll believes that curriculum is a process not of transmitting what is known but of exploring what is unknown; and through exploration students and teachers "clear the land" together, thereby transforming both the land and themselves. Learning and understanding come through dialogue and reflection. The role of curriculum is to help us negotiate these passages; towards this end it should be *rich, recursive, relational, and rigorous*. As we leave our present century and paradigm for another century and paradigm, we need to develop a new set of criteria as to what constitutes an effective curriculum.

Doll emphasises both the constructive and nonlinear nature of a post-modern curriculum which emerges through the action and interaction of the participants. He considers curriculum in terms of constructing a matrix in keeping with Dewey's idea of mind as a verb and Bruner's idea of it "as an instrument of construction". He emphasises the concepts of self-organisation, indeterminacy, stability across and through instability, order emerging spontaneously from chaos and the creative making of meaning and considers these nonlinear concepts a new set of curricular criteria.

Self-organisation

In post-modernism, self-organisation is a major component. Originally, this is a term used to characterise the autonomy of biology. Prigogine (1980) contributes to the understanding of the concept of self-organisation by saying that it is not telelogical (moving to a predetermined end) nor teleonomic (purposeful adaptation to the environment, as in the preservation and function of life). Self-organisation is open-ended. The future evolves from the present (and the past) and is dependent on interactions that have happened and are actually happening. The open-endedness of this process is in its initiation of a next stage; the past does contribute but only partially to this initiation. It is the dialogue between the present construct and the problems of the environment that determines the emerging, next stage. A curriculum model designed along these transformational lines has the potential to be rich in generation. The process of self-organisation depends on reflective action, interaction, transaction - key points in the curriculum theorizing of Jean Piaget, Jerome

Bruner and John Dewey.

One requirement for self-organisation to work is perturbation. A system self-organises only when there is perturbation, problem or disturbance (when the system is unsettled and needs to resettle) to continue functioning. As Piaget says, this unsettlement (disequilibrium) "provides the driving force" of redevelopment. Curriculum designed with self-organisation as a basic assumption is qualitatively different from curriculum designed with the assumption that the student is only a receiver. In the former, challenge and perturbation become the *raison d'etre* for organisation and reorganisation. In the latter, challenge and perturbation become disruptive and inefficient, qualities to be removed and stamped out as soon as possible.

Open Systems

Prigogine (1961) points out that in thermodynamics it is common to refer to systems as isolated, closed or open. Isolated systems "exchange neither energy nor matter". It is the type of system that Socrates envisioned in his concept of knowledge being recycled. Closed systems, on the other hand, a development of the modernist paradigm, "exchange energy but no matter".   Open systems, a development of the post-modernist paradigm, "exchange both energy and matter". The key point is that isolated systems exchange nothing, being at best cyclical; closed systems transmit and transfer; open systems transform.

For the most part, the modernist curriculum has adopted the closed version where knowledge is transmitted and transferred. The post-modern curriculum has adopted the open version where learning is a transformative process. Open systems require disruptions in order to function while closed systems resist disruptions.

Goals, Plans, Purposes

Doll favours Dewey's view that a curriculum should honour an individual's ability to form, plan, execute, and evaluate as well as his planning activities - that is, his actual doing of planning. Such a curriculum should be based on an interactive, not a spectator, pedagogy and epistemology.

There are two crucial misconceptions in the modernist curriculum. One is that an individual is assumed to best develop planning skills by being a passive receiver or copier of another's plans rather than by being an active participant or discoverer of knowledge. The second is that we have assumed a cosmology based on a universe stable in order. This simplistic view of a stable universe has been found to be inadequate. Complexity is the nature of Nature. Undoubtedly, it assumes concepts not recognised by modernism for example, self-organisation and transformation. Goals, plans and purposes should arise not purely prior to but also from within action. Plans arise from action and are modified through actions. The two are interactive, each leading into the other and depending on the other.

Evaluation

Doll remarks that in the modernist curriculum, our frame for teaching is based on a closed set. The teacher helps students to acquire a particular, set body of knowledge in a particular, set way. Evaluation is mainly based on grades attained by students. In a modernist frame, evaluation is basically used to separate winners from losers. However, in the post-modern, transformative curriculum, there is no ideally set norm, no canon which serves as a universal reference point. Evaluation, in a post-modern frame, serves a different function. It would be essentially a negotiary process within a communal setting for the purpose of transformation. The teacher would play a central role in this process but would

not be the exclusive evaluator; evaluation would be communal and interactive. It would be used as feedback, part of the iterative process of doing-critiquing-doing-critiquing. The focus would be on helping students to develop intellectual and social powers through dialogue and constructive critiques.

THE FOUR R'S-AN ALTERNATIVE TO THE TYLER RATIONALE

Doll suggests the four R's of Richness, Recursion, Relations and Rigor to serve as the criteria to foster a post-modern view and evaluate the quality of a post-modern curriculum.

Richness

This refers to a curriculum's depth, to its layers of meaning, to its multiple possibilities or interpretations. In order for students and teachers to transform and be transformed, a curriculum needs to have the "right amount" of indeterminacy, anomaly, inefficiency, chaos, disequilibrium, dissipation and lived experience. The concept of developing richness through dialogue, interpretations, hypothesis generation and proving, and pattern playing can apply to all we do in curriculum.

Recursion

Bruner (1986) states that "any formal theory of mind is helpless without recursion" and asserts the importance of recursion for epistemology and pedagogy. This is also the way one produces a sense of self, through reflective interaction with the environment, with others, with a culture. Doll stresses that "recursive reflection" lies at the heart of a transformative curriculum. Bruner (1960) defines a recursive curriculum by his "spiral curriculum". Dewey points out that every ending is a new beginning, every beginning emerges from a prior ending. Recursion aims at developing competence - the ability to organise, combine, inquire and use something heuristically. Its frame is open.

Relation

The concept of relations is important to a post-modern, transformative curriculum in two ways, in a pedagogical way and in a cultural way. In focusing on pedagogical relations, one focuses on the connections within a curriculum's structure which give the curriculum its depth as this is developed by recursion. The concept of cultural relations grows out of a hermeneutic cosmology - one which emphasises narration and dialogue as key vehicles in interpretation. Bowers (1987) has tied the concept of cultural relationships to the ecological crises we face today. He draws our attention to modernism's strong sense of individualism. Individualism has tended to pit humanity against nature and to believe that progress occurs through competition, not cooperation. This belief, unfortunately, is part of our present day pedagogy and cosmology.

Rigor

Rigor, in some ways, is the most important of the four criteria. It keeps a transformative curriculum from falling into either "rampant relativism" or sentimental solipsism. It moved from Aristotlean-Euclidean logic to deeply felt

perceptions and conceptions. The English empiricists wanted to move rigor away from subjective states to the objective and observable. Rigor can enter a world that can be measured and manipulated.

Rigor in a post-modern frame draws on qualities foreign to a modernist frame, for example, interpretation and indeterminacy. Rigor can be defined in terms of mixing the two. The quality of interpretation, its own richness, depends on how fully and well we develop the various alternatives indeterminacy presents. It seems necessary to build up a community which is critical as well as supportive.

Doll's Model has been described. It can be seen that some principles of Doll's Model are similar to those of Habermas's Emancipatory Model of the curriculum. It is useful to make a comparison between the two models [7].

Strengths of Doll's Model

It can be seen that Doll's Model has a lot more strengths than those of Tyler's in the qualitative aspect. It is a post-modern, transformative curriculum better suited to the demands of the new era. The open system encourages critical thinking, decision-making by all people thus promoting a democratic society. Hargreaves held a view similar to Doll in the concept of a post-modern world. He argues that " the kinds of organisations most likely to prosper in the post-industrial, post-modern world, it is argued, are ones characterised by flexibility, adaptability, creativity, opportunism, collaboration, continuous improvement, a positive orientation towards problem-solving and commitment to maximising their capacity to learn about their environment and themselves."

Doll's Model aims at promoting higher order competence as opposed to acquisition of subject knowledge of the curriculum. The classroom atmosphere is different from that of the traditional classroom. The teacher is no longer an authority, but a facilitator and transformative intellectual who caters for individual needs and differences. Learning is much more interactive, interesting, motivating and flexible.

Here the Model again is in line with the style advocated by Hargreaves. He argues that "processes of inquiry, analysis, information gathering and other aspects of learning how to learn in an engaged and critical way become more important as goals and methods for teachers and schools in the post-modern world".

The Model fosters communication, independence and self-organisation. Opportunities for reflection are offered throughout the course of learning. The Four R's of the curriculum set down the principles of an effective curriculum.

Criticisms of Doll's Model

Tyler's Model is neat, systematic and scientific, but Doll's Model appears to be vague and unclear. Doll's Model is, to a certain extent, unrealistic, idealistic, impracticable, and assertive. The open system Doll advocates may diverge to some unexpected or undesirable consequences. Conservative educationalists may find it insecure, unstable and uncertain. The Model may challenge the status and culture of teachers as respectable experts. Moreover, successful implementation of the curriculum based on Doll's Model requires highly professional staff who are confident, resourceful and ready to meet the challenges. It may be too demanding on teachers. The kind of outcome is difficult to assess. Hence, in terms of reliability and consistency, it is not considered a good Model. The Model may pose a threat to government and bureaucracies as it does not favour central control with regard to decision-making, social welfare and education.

IMPLICATIONS FOR THE HONG KONG CURRICULUM

The Tyler Model and the Doll Model and their respective strengths and weaknesses have been described in the previous sections. In this section, their implications for the Hong Kong school curriculum will be discussed. The Tyler Model has been influential for many years in Hong Kong and it forms the foundation of the school curriculum. But in recent years, the school curriculum has been found to be inadequate and there are attempts to introduce a new curriculum to respond to the fast changing world and the needs of the new century. The author is of the view that it is highly desirable that the new school curriculum in Hong Kong should embody the key concepts of the Doll Model which are characteristic of postmodernism. This section will examine the arguments for this point of view and a few recommendations will also be made.

Background

Compulsory education was enforced in 1971 for primary education in Hong Kong. From September 1978, the Government was able to provide sufficient places for every primary school leaver to proceed to three years of free junior secondary education. During the transition from a highly selective system to a system of free and compulsory education, quantitative concern was dominant. Morrison (1997a) points out that the relationship between the curriculum and the wider society is complex and ambiguous [8].

The curriculum in 1960's to 1980's in Hong Kong was essentially based on Tyler's Model which was highly prescriptive and closed. It was most suitable for colonial education because it promoted central control and stability. There was undue emphasis on "high status" knowledge which was academic, subject bound, abstract and theoretical. It was taught to the elite children. "Low status" knowledge of the opposite nature was taught to the mixed ability groups. The keen competition for school places made education serve the purpose of preparing students for examinations. Students had to devote all their time and energy to pursue knowledge and examination skills. They did not show interest in extra-curricular activities. Teachers were discouraged from talking about politics or any sensitive issues about the government. Little emphasis was placed on the development of cognitive skills in students.

The Target Oriented Curriculum

A significant change in the education system resulted from the unexpected new political situation in 1984 when there was a joint declaration by Britain and China that the sovereignty of Hong Kong would revert to China in 1997. This had important consequences on the school curriculum. The new direction of education would serve to foster democracy and autonomy of the people. A major change in the school curriculum came in 1991 when the Education Commission's Report No.4 made recommendations on improving the quality of education in Hong Kong. The Target Oriented Curriculum (TOC) Framework was introduced.   Noteworthy was the emphasis on the development of the higher order thinking skills, namely, communicating, inquiring, conceptualising, reasoning and problem-solving. The Target Oriented Curriculum initiative provided the Hong Kong education system with an opportunity to respond to the contextual requirements of the times, to address a number of major problems in the present education system, and to ensure that current conceptions of learning, progression and knowledge were built into the curriculum. It aimed at developing the capabilities of each individual to maintain and enhance the quality of life in our community.

The TOC shows a marked improvement over the curriculum in the past. It is moving towards the direction of a

post-modern curriculum as evidenced by the following features:

- the curriculum is process-oriented rather than focus on the product only,
- it lays emphasis on the development of higher order thinking skills and fosters creativity,
- the teacher is no longer the authority in the classroom. Instead, he acts mainly as a facilitator, helping children construct knowledge. Knowledge is not simply transmitted,
- curriculum strategies address learner differences. Graded tasks are used to cater for students with different abilities.

However, it is handicapped by its inherent modernist nature in that

- it is still prescriptive and system-driven. The linear sequence of Tyler Model is followed: chosen targets, selected experiences, planned organisation and evaluation,
- its degree of openness is limited, since there is prediction and control,
- it assumes development based on stability; the concept of order emerging from chaos is lacking, and
- it is not transformative enough and there is limited self-organisation.

Curriculum review

Since 1999, a holistic review of the school curriculum has been conducted in Hong Kong with a view to preparing the younger generation to meet the challenges of the 21st Century. In 2000, a new curriculum framework for **Learning to Learn** was introduced. Key learning areas, generic skills, and values and attitudes are identified. The Curriculum Development Council has set out the following overall aim of the school curriculum:

> *The school curriculum should provide all students with essential life-long*
> *learning experiences for whole-person development in the domains of*
> *ethics, intellect, physical development, social skills and aesthetics,*
> *according to individual potentials, so that all students can become active,*
> *responsible, and contributing members of the society, the nation*
> *and the world.*
> *The school curriculum should help students learn how to learn through*
> *cultivating positive values, attitudes, and a commitment to life-long*
> *learning, and through developing generic skills to acquire, construct and*
> *communicate knowledge. These qualities are essential for whole-person*
> *development to cope with challenges of the 21st Century.*
> *A quality curriculum for the 21st Century should therefore set the directions*
> *for learning and teaching through a coherent and flexible framework*
> *which can be adapted to changes and different needs of students and*
> *schools.*

The school curriculum for the 21st Century is defined as the learning experiences to be provided to students necessary for achieving the aims of education in Hong Kong. The curriculum framework consists of three components: Key Learning Areas (knowledge/concepts), Generic Skills, and Values and Attitudes. There are eight key learning areas,

namely Chinese Language Education, English Language Education, Mathematics Education, Personal, Social, Humanities Education, Science Education, Technology Education, Arts Education and Physical Education.

Nine types of generic skills fundamental to help students learn better are identified as essential. They are collaboration skills, communication skills, creativity, critical thinking skills, information technology skills, numeracy skills, problem-solving skills, self-management skills and study skills. It can be seen that the skills cover the basic skills as well as higher order thinking skills. They are not entirely new and some of them, such as communication skills and problem-solving skills have been emphasised in the TOC.

RECOMMENDATIONS

The introduction of the TOC has undeniably brought improvement in education in Hong Kong, but it still leaves much to be desired. Hong Kong is in need of a post-modern and transformative curriculum. The four R's of Doll's Model and the concept of self-organisation can help to develop a more effective curriculum in Hong Kong. The recent curriculum reform has apparently taken into consideration the principles of more effective models of post-modern and transformative curricula. The new curriculum framework lays due emphasis on constructivism and encourages critical thinking and learning by interaction and participation. However, it can be further developed so that it embodies the major qualities of a post-modern curriculum as advocated by Doll. To help schools put the curriculum framework into action, there is a need to provide teachers and school heads with professional development courses to enhance their professional competence and understanding of the school curriculum. At the same time, supportive measures should be adopted and extra resources should be provided to schools to help them improve and implement their curricula. It is also recommended that more classroom research be conducted to develop teaching and learning strategies to enhance students' generic skills and the assessment strategies of such skills.

CONCLUSION

In this essay, the concepts of modernism and post-modernism have been discussed. Models of Tyler and Doll as typical of modernist and post-modern curricula have also been appraised. Clearly, both Models have their respective strengths and weaknesses. The Tyler rationale has been used as a general curricular foundation for many decades. Owing to its inadequacies, it is necessary to develop a new paradigm with a new set of criteria in order to design an effective curriculum. The 21st Century curriculum should desirably be post-modern in nature: open, rich, creative and characterised by a classroom atmosphere that offers chance for reflection, fosters higher order thinking skills and self-organisation. At the same time, it is useful to retain some of the strengths of Tyler's Model in the new curriculum. In proposing any education reform, educationalists should consider the point of view of UNESCO (1996) which set out the "Four Pillars of education" [9] for the twenty-first century: *learning to know, learning to do, learning to live together and learning to be*. We are pursuing and striving for quality education. A post-modern curriculum which adopts an open vision will undoubtedly contribute to our attaining the goal.

End Notes

1. Dalin and Rust (1996) point out that ten major revolutions have taken place, namely, the knowledge and information revolution, the population revolution, the globalizing and localizing revolution, the social relationships revolution, the economic revolution, the technological revolution, the cological revolution, the aesthetics revolution, the political revolution and the values revolution.

2. Principles of chaos theory
    -   small scale changes in initial conditions can produce massive and unproductive outcome,
    -   very similar initial conditions can produce very dissimilar outcomes,
    -   regularity and uniformity break down to irregularity and diversity,
    -   effects are not straightforward continuous functions of causes,
    -   determination is replaced by indetermination; linear and stable systems are replaced by "dynamic", changing, evolving systems and non-linear explanations of phenomena,
    -   long-term prediction is impossible.

3. Five general principles for selecting experiences:
    -   For a given objective to be attained, a learner must have experiences that give the opportunity to practise the kind of behaviour implied by the objective.
    -   Second, the learning experience can give the learner satisfaction during the process of learning.
    -   Third, the reactions desired in the experience are within the range of possibility for the learner concerned. This means that the learning experience should be appropriate to the learner's present attainments, his predispositions and the like.
    -   Fourth, there are a variety of learning experiences that can be used to attain the same educational objective. This implies that the teacher has a wide range of creative possibility in planning particular work.
    -   Fifth, the same learning experience will usually bring about several outcomes. A well-planned set of learning experiences will be made up of experiences that at the same time are useful in attaining several objectives.

4. Three criteria for effective organisation
    -   The first is continuity which refers to vertical reiteration of curriculum elements.
    -   The second is sequence which is related to continuity but goes beyond it. It emphasises the importance of having each successive experience built upon the preceding one and going more broadly and deeply into the matters involved.
    -   The third is integration referring to the horizontal relationship of curriculum experiences. It helps the learner to get a unified view and to unify his behaviour in relation to the elements dealt with.

5. The theories were first developed during Tyler's work on the Eight Year Study, where 30 experimental schools engaged in a wide range of curriculum initiatives.   The results of the Eight Year Study were favourable to the experimental schools.

6. Comparison with Habermas's Model of the Curriculum

    Habermas's view, in line with the Marxism that informs his work, is premised on fundamental principles of social justice, the promotion of social equality, and the nurture of "generalisable interests" (Habermas, 1976a), and the commitment to the emancipation of society.

Grundy (1987) argues that Habermas's knowledge-constitutive interests inform three styles of curriculum design:

- a rationalist/behaviourist "curriculum as product" view of the curriculum revealing the "technical" knowledge-constitutive interest;
- a humanistic, interpretative, pragmatic "curriculum as practice" view of the curriculum, embodying the hermeneutic knowledge-constitutive interest;
- an existential, empowering and ideological-critical view of the "curriculum as praxis" embodying the emancipatory interest.

Morrison (1997) points out that these styles provide a neat typology of educational goals and design models which enable systems of knowledge to be constructive; on the other hand, they are perhaps too conceptually neat. They fail to see the necessary interconnections and overlaps between what appear to be discrete ideal types. They also tend to trivialise the curriculum to the easily measurable, that is addressing the lower order behaviours rather than higher order thinking. They often reduce the complexity of the curriculum to simplistic statements. Finally, they exert a constraining influence on individual empowerment, emancipation and freedom which is the characteristic of post-modernism.

The Technical Model of the Curriculum

Habermas's technical interest can be seen in the objectives or behavioural model of planning which features in literature from Tyler. In this model, the evidence for learning is demonstrated in the behaviour of students, evaluation of learning thus becomes assessment of end behaviour. The curriculum is cast in an instrumental view, focusing on controlling the content and outcomes. There is strong prescription and strong framing, arguing that the most rational way to plan a curriculum is to decide first the objectives and then find the most suitable means of achieving those ends - a means-end model which is an example of a technicist mentality which leaves aims unquestioned.

Tyler's Model and Habermas's Technical Model of the curriculum are undesirable as complete model of the design in education. They tend to cast students in a passive mode, emphasizing control and understanding rather than empowerment.

7. Comparison with Habermas's Emancipatory Model of the Curriculum

It can be seen that some principles of Doll's Model are similar to those of Habermas's Hermeneutic and Emancipatory Model of the curriculum (Grundy, 1987). The latter serves student empowerment both in content and process, developing participatory democracies, engagement, student voice. Habermas sees in the development of freedoms the need for education to maximise generalisable interests and to serve the furtherance of equality in society, The rejection of a narrowly instrumentalist education coupled with the need for education to serve democracy, liberty and equality reinforces the need for citizenship education.

Habermas's views are fruitful in suggesting curriculum aims some of which are:

- the need to develop students' empowerment and freedom,
- the need to develop communicative competence,
- the need for education to promote equality and democracy,
- the need to develop flexibility and democracy, and
- the need to develop negotiated learning.

Clearly, they are in line with those advocated by Doll.

8. Morrison (1997a) points out that the curriculum can be viewed as an ideological selection from the available cultures, values and interests in society. It affects, effects and is affected somehow by the purposes, structures and contents of the wider society. The curriculum is neither value free nor ideologically innocent, because it is necessarily selective and that selection will support some sectors of society rather than others. Modern Critical theorists hold that the curriculum is inherently political and that therefore, the politics of the curriculum should expose the ideological, political, dominatory groups and interests in society being served by the curriculum.

9. "Four Pillars of Education":

- learning to know

  This means learning to learn so as to benefit from the opportunities education provides throughout life.

- learning to do

  This means acquiring the competence to deal with many situations and work in teams. It also means learning to do in the context of young people's various social and work experiences which may be formal or informal.

- learning to live together

  This means developing an understanding of other people and an appreciation of interdependence as well as a spirit of respect for the values of pluralism, mutual understanding and peace.

- learning to be

  This means developing one's personality and being able to act with ever greater autonomy in judgements and personal responsibility. Education must not disregard any aspects of a person's potential: memory, reasoning, aesthetic sense, physical capabilities and communication skills.

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