Paradigm Shifts in Quality Improvement in Education: Three Waves for the Future

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(Abstract)

Facing up the challenges in the new millennium, education reform has inevitably become a necessary to pursue educational quality and effectiveness in the Asia-Pacific Region and other parts of the world. Unfortunately most educational reforms in the past two decades resulted in serious frustration and failure even though they often had a good will. Reviewing the policy initiatives since 1980s and earlier, this presentation will point out world wide education reforms for education quality are experiencing three waves. Different waves are based on different paradigms and theories of education quality and school effectiveness, and they result in different strategies and approaches to education assurance. The **first wave** of school reforms and initiatives focuses mainly on *Internal Quality Assurance* and makes effort to improve internal school performance particularly the methods and processes of teaching and learning. The **second wave** emphasizes *Interface Quality Assurance* in terms of organizational effectiveness, stakeholders' satisfaction and market competitiveness and makes effort to ensure satisfaction and accountability to the internal and external stakeholders. Suffering from the narrow conception of school functions and quality, many initiatives of the first two waves cannot meet the challenges and needs of rapid transformations in an era of globalization and information technology.

My presentation will further explain that the coming improvement initiatives should be moving towards the **third wave** which emphasizes strongly *Future Quality Assurance* in terms of relevance to the new school functions in the new century as well as relevance to the new paradigm of education concerning contextualized multiple intelligences (CMI), globalization, localization and individualization. In pursuit of not only internal and interface quality but also future quality in education in the new millennium, this presentation proposes a new paradigm for quality assurance in school education.

Based on the new paradigm in the third wave, the concepts of value added and value created are completely different in education quality. The enhancement of value added of an education institution depends heavily on improvement of internal process while value created relies mainly on the increase in goal relevance and stakeholder satisfaction with quality of education services. Continuous institutional development through a spiral curve along the time span is necessary for total quality in the new millennium. New implications for research, policy and practices that are fundamentally different from the traditional thinking, will benefit local and international efforts for quality assurance and enhancement.

Introduction

Since the turn of the new century, there have been drastic impacts from economic globalization, advances in information technology, international market competitions, and rapidly increasing local social-political demands on nearly every country in the world. Facing up these impacts and challenges, numerous education reforms have been initiated in the Asia-Pacific Region and other places (Cheng & Townsend, 2000). According to Cheng (2001a), the world-wide education reforms are experiencing three waves since the 1970s. The three waves of reforms are mainly based on different paradigms and theories of education effectiveness, and they result in the employment of different strategies and approaches to changing schools and education.

Assuming goals and objectives of education are clear and consensus to all, the first wave of school reforms and initiatives since the 1970s focuses mainly on *internal effectiveness*, with efforts made to improve internal school performance particularly the methods and processes of teaching and learning. Many changes are government-directed and top-down, with the aim to improve school arrangements and education practices, thus enhancing their effectiveness in achieving the goals and objectives planned at either the site level or the system level. Improvement of teacher and student performance up to identified standards obviously had been a popular and important target for educational reform.

Responding to concerning the accountability to the public and stakeholders' expectation in the 1990s, the second wave of education reform emphasizes *interface effectiveness* in terms of education quality, stakeholders' satisfaction, and market competitiveness, with most policy efforts aim to ensure quality and accountability to the internal and external stakeholders (Evans, 1999; Goertz & Duffy, 2001; Coulson, 1999; Headington, 2000; Mahony & Hextall, 2000; Heller, 2001). Quality assurance, school monitoring and review, parental choice, student coupon, parental and community involvement in governance, school charter, and performance-based funding are some typical examples of measures to pursue and enhance effectiveness at the interface between the school and the community (Cheng & Townsend, 2000). How to improve the existing structures, organizations, and practices in education at different levels to meet stakeholders' needs and expectations, is a major concern in the second wave of reforms.

At the turn of the new century, the effects of many initiatives of the first and second waves have been doubted whether they can meet the challenges and needs of rapid transformations in an era of globalization and information technology. Particularly when knowledge-driven economy and information technology are strongly emphasized in the new millennium, people urge paradigm shift in learning and teaching and demand reforming the aims, content, practice, and management of education at different levels to ensure their relevance to the future (Cheng, 2000a, b; Daun, 2001; Burbules & Torres, 2000; Stromquist & Monkman, 2000). The emerging third wave of education reform emphasizes strongly *future effectiveness* in terms of relevance to the new education functions in the new century as well as relevance to the new paradigm of education concerning contextualized multiple intelligences, globalization, localization and individualization. The pursuit of new vision and aims at different levels of education, life-long learning, global networking, international outlook, and use of information and technological are just some emerging evidences of the third wave (Cheng, 2001a).

The above three waves of education reforms provide a general typology to capture and understand the key paradigms and characteristics of various education reforms in international contexts in these years. Different countries or areas may have different historical and contextual constraints, and therefore their progress and characteristics of education reforms may be different and move towards different waves. For example, some countries may be still struggling for internal effectiveness at the first wave with focus mainly on improvement of internal process. Some countries may move towards the second wave or a mix of the first and second waves to pursue both internal and interface effectiveness. In addition to the internal improvement of school process, they implement different measures and initiatives to ensure education quality and stakeholders' satisfaction. Responding to the challenges of globalization and impacts of information technology, some countries may have already started the third wave of education reforms to pursue for future effectiveness with emphasis on relevance of education to new school functions and new paradigm of learning in the new millennium.

These three waves represent changes in paradigms and theories of education quality and school effectiveness, and they also result in different strategies and approaches to education assurance. The **first wave** of school reforms and initiatives focuses mainly on *Internal Quality Assurance* in terms of improving and ensuring the methods and processes of teaching and learning meeting the planned education aims. The **second wave** emphasizes *Interface Quality Assurance* in terms of ensuring organizational effectiveness, stakeholder satisfaction and accountability to the public. Suffering from the narrow conception of school functions and quality, many initiatives of the first two waves cannot meet the challenges and needs of rapid transformations in an era of globalization and information technology.

This paper aims to review the characteristics and paradigms of quality assurance in the first and second waves and then explain why the coming initiatives for quality assurance should be moving towards the **third wave** which emphasizes strongly *Future Quality Assurance* in terms of ensuring the relevance to new education functions in the new century as well as the relevance to the new paradigm of education. In pursuit of not only internal and interface quality but also future quality in education in the new millennium, this paper proposes a new paradigm for quality assurance in education.

First Wave: Internal Quality Assurance

Effectiveness in Teaching and Learning

Traditionally, the discussion of education quality in this first wave focuses heavily on the effectiveness of internal education processes particularly teaching and learning in classroom. In this line of thinking, *education quality* mainly refers to the achievement of planned education goals particularly in terms of students' education outcomes. The higher achievement in planned education goals implies the better quality in education. In this sense, education quality is not different from education effectiveness. Also, *quality assurance* often refers to the efforts for improving the internal environment and processes such that the effectiveness of learning and teaching can be ensured to achieve the planned goals (Cheng, 1997a). This type of quality assurance may be named as "**Internal Quality Assurance**". As

shown in Figure 1, the structure of effectiveness in teaching and learning can provide an useful overall view on how strategies and initiatives can be conceptualised and organized to ensure internal quality in education (Cheng, 1995a, 1998).

Education effectiveness in classroom is a comprehensive conception even though it is often assessed by the quality and quantity of achieved student learning experiences and outcomes. The structure shows how the key internal factors such as teacher factors, curriculum factors, contextual factors, and student factors are related to student learning experiences and educational outcomes. It assumes the following procedural inter-relationships among the components of internal education effectiveness (Cheng, 1998; Medley, 1982):

(1) Student learning outcomes are the product of the interaction between curriculum characteristics, student learning experience and individual characteristics;

(2) Student learning experience is affected by teacher performance, curriculum characteristics, and classroom environment;

(3) Teacher performance is determined by the interaction between teacher competence, curriculum characteristics and school organizational environment;

(4) External teacher education, school-based teacher education, and pre-existing teacher characteristics can contribute to teacher competence; and

(5) Teaching evaluation based on the information from teacher performance, student learning experience and learning outcomes can be used to facilitate development of teacher competence through staff development activities.

Figure 1:   Structure of Education Effectiveness in the Classroom
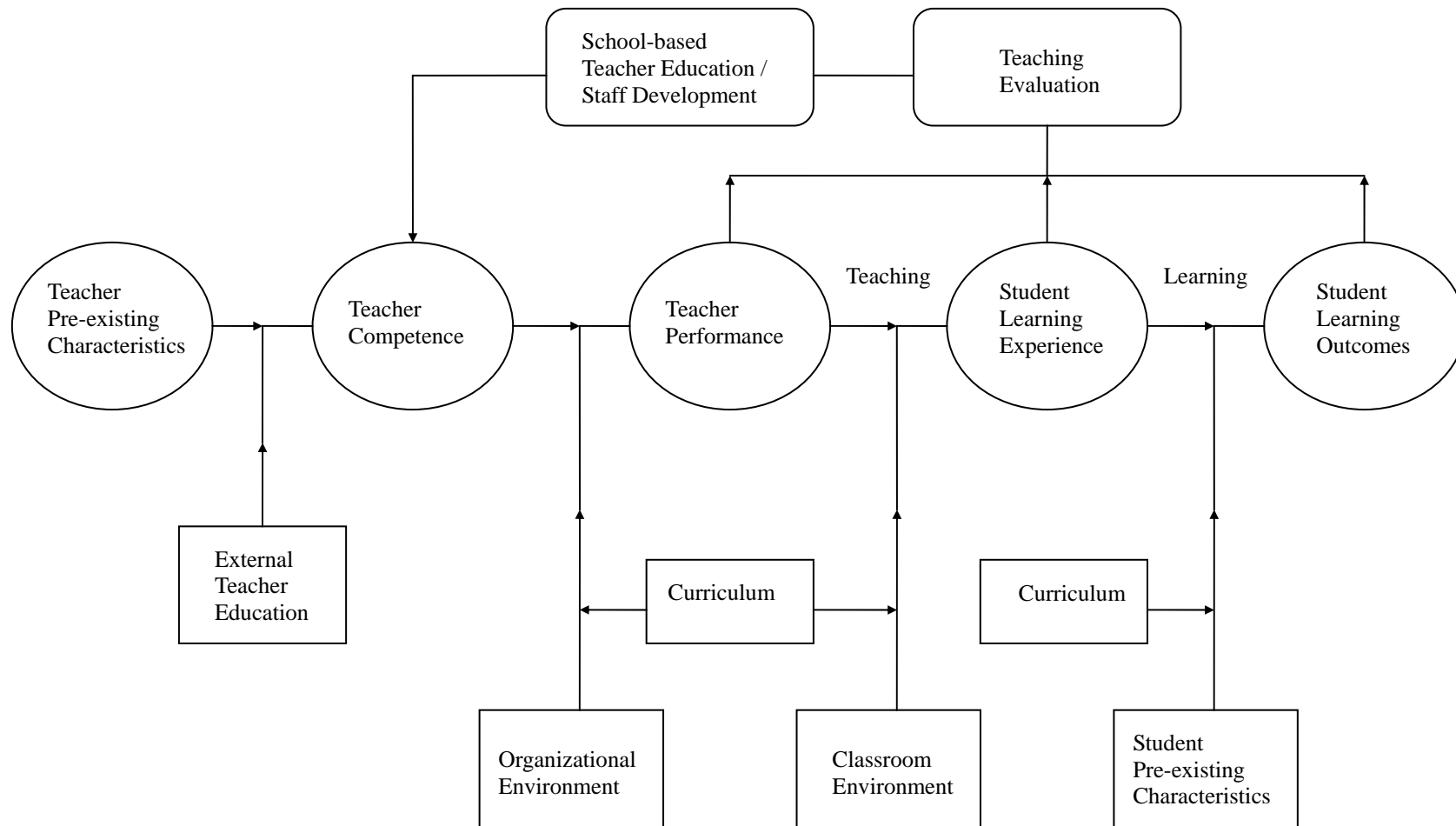
(from Cheng, 1998)

Approaches to Ensuring Internal Quality

From this structure, there may be two different approaches that can be used to ensure education quality or effectiveness in classroom. They are the component quality approach and the relationship quality approach.

The Component Quality Approach

This approach focuses on improving the quality of some components of the structure with a hope to enhance or ensure the quality in student learning outcome. For example, many improvement initiatives take teacher competence as the key factor for internal quality and make effort to improve teacher competencies such as language skills, pedagogic knowledge, subject knowledge, use of information technology in education, etc. In the past years, there have been different types of improvement efforts for internal quality assurance in education such as school management improvement, classroom environment improvement, teaching improvement, learning improvement, curriculum improvement, evaluation improvement, and teacher education and quality improvement. All these efforts focus on improvement of the quality of certain components with aims to achieve planned education goals. Table 1 shows some examples of this component quality approach.

Currently, based on this approach, there is a strong emphasis on using the benchmarking concept (Bogan & English, 1994) to ensure the quality of each component of the education effectiveness reaching at a certain standard. For example in Hong Kong, English language teachers were asked to take a benchmark examination in order to show their English language proficiency reaching at a given benchmark (Coniam, Falvey, Bodycott, Crew, & Sze, 2000).

This component quality approach has its inherent limitations. The improvement conception is often simplistic and separated because it ignores the relationship between one component and other components of education effectiveness. The improvement of one component does not promise the quality of other components and the better outcomes of students' learning. For example, the enhancement of teacher competence may not promise the improvement of teacher performance or student learning experience because there are also influences from organizational environment and classroom environment. Similarly, the improvement of classroom environment may not imply quality and improvement in student learning outcomes because teacher performance, curriculum, and even student own pre-existing characteristics are also important factors intervening the learning process and outcome. Therefore, it is not a surprise that many improvement initiatives of the first wave reform using this component quality approach often result in disappointment and failure for ensuring quality in education even though huge volume of resources has put into improving certain components of education effectiveness. The experiences in the first wave of Hong Kong education reforms can provide a clear example of the limitations of this approach to quality assurance in school education (Cheng, 2000b, 2001c).

Table 1: The Component Quality Approach

Improvement Of Component Quality	Examples of Factors to be Improved
Teaching Improvement Type	
• Improve Teacher Competence	e.g. language skills, pedagogic knowledge, information technology skills, subject knowledge, ethical and legal knowledge in education, etc.
• Improve Teacher Performance	e.g. teaching styles, teaching attitudes, teaching strategies, behaviors, use of facilities, teaching materials, classroom management pattern, leadership to students, etc.
Learning Improvement Type	
• Improve Student Learning Experience	e.g. learning activities, learning strategies, experiences, responses and feelings, interaction with peers, skill practice, affective expression, physical performance, intellectual stimulation and exercise, etc.
• Improve Student Learning Outcome	e.g. academic achievements, reading ability, writing ability, developed self efficacy in learning, computer literacy, moral development, citizenship, skill and motivation of continuous self learning, etc.
Curriculum Improvement Type	
• Improve Curriculum and its Characteristics	e.g. learning aims and goals, teaching and learning tasks, textbooks, subject syllabus, curriculum design, medium of instruction, teaching materials, etc.
Evaluation Improvement Type	
• Improve Evaluation of Teaching & Learning	e.g. supervision, classroom observation, student achievement assessment, teacher self evaluation, teaching portfolio, evaluation by students, etc.
Classroom Environment Improvement Type	
• Improve Classroom Environment for Teaching and Learning	e.g. existing social climate, class size, level and diversity of students' academic ability in the class, teaching and learning facilities, equipment, physical conditions, etc.
School Management Improvement Type	
• Improve Organizational Environment for Teaching and Learning	e.g. instructional leadership, program planning, team support, staff development in area of instruction, staff professionalism, management of curriculum, school mission and goals, policy of program design and implementation, human relations, school culture, school's physical environment, etc.
Teacher Education and Quality Improvement Type	
• Improve Teacher Personal Characteristics	e.g. academic qualifications, working experiences, personalities, self concept and efficacy, beliefs and values about education and society, personal vision and mission, cognitive styles, age, etc.
• Improve School-based Teacher Education / Staff Development	e.g. workshops, experience sharing, collaborative teaching, reflection on teaching, educational visits, job enrichment, etc.
• Improve External Teacher Education	e.g. goals, objectives, methods, content, course designs, organization, relevance of programs, quality of teaching, etc.

The Relationship Quality Approach

Different from the component quality approach, the relationship quality approach focuses mainly on improving the quality of relationship between components of the effectiveness structure. It is assumed that the better relationship between components, the better impacts of components on the quality in student learning outcomes. It means that improvement of relationship between components is the key for ensuring education quality in classroom. Table 2 provides some examples of the relationship quality approach. For example 3 in this table, the improvement effort can focus on ensuring the quality of teacher competence and organizational environment related to positive teacher performance in classroom. Another example, say example 2 in Table 2, the improvement effort can focus on providing a coherent and positive linkage between teacher performance and characteristics of classroom environment and curriculum in order to enhance the quality of student learning experiences. In other words, it is to ensure that the teacher can adapt his/her teaching performance to the classroom characteristics (such as class size, student composition, social climate, etc.) and the curriculum features (such as learning objectives and tasks, subject content, etc.) in order to maximize the learning opportunities for different students.

This relationship quality approach is comparatively powerful than the component quality approach in ensuring education quality because it ensures not only the quality of separate components but more the quality of relationship between components. The successful application of this approach is based on the understanding of the relationships between components. Therefore there is a strong demand for a more sophisticated knowledge base about these relationships. Without such a knowledge base, it is impossible to know how to ensure these relationships contributing to the quality in student learning outcomes.

Furthermore, in the structure of education effectiveness, all factors are directly or indirectly related in different stages of the teaching and learning processes (see Figure 1). If the relationship quality approach just focuses on the improvement of certain relationships but not all, it cannot promise the contribution of all the components and their relationships converging to the total internal quality in education.

Table 2:   The Relationship Quality Approach (Examples)

Ensuring Relationship Quality between Components	Quality to be Enhanced Through Ensuring Relationship
Example 1: Between • Student Learning Experience • Curriculum Characteristics • Student Pre-existing Characteristics	• Quality of Student Learning Outcomes
Example 2: Between • Teacher Performance • Curriculum Characteristics • Classroom Environment	• Quality of Student Learning Experience
Example 3: Between • Organizational Environment • Teacher Competence • Curriculum Characteristics	• Quality of Teacher Performance
Example 4: Between • External Teacher Education • Teacher Pre-existing Characteristics • School-based Staff Development	• Quality of Teacher Competence

Models of Internal Quality Assurance

According to Cheng (1996a) and Cheng & Tam (1997), there are eight models of education quality that can be used to understand and manage quality of education from a perspective taking educational institution and its interface with environment into consideration. Table 3 summarizes the conception of quality assurance, conditions of usefulness, and key areas of concern of these models. The first three models, including the goal and specification model, the process model and the absence of problem model, are concerned with the internal quality assurance focusing on internal goal achievement, process improvement, and internal problem avoidance. These models can be used to manage and ensure internal quality in education.

The Goal and Specification Model. The goal and specification model assumes that there are clear, enduring, normative and well accepted goals and specifications as indicators and standards for education institutions or education systems to pursue or conform. As discussed in the previous part on internal quality assurance, education quality defined by this model is the achievement of the stated goals or conformance to the specifications listed in the institutional plan or program plans. It is a type of internal quality. Quality assurance by this model is to ensuring achievement of stated goals and conformance to given specifications. The typical examples of quality indicators to be used may include students' academic achievements, attendance rate, dropout rate, and personal developments, number of graduates enrolled in universities or graduate schools, staff's professional qualifications, etc.

The Process Model The model assumes that nature and quality of institution process often determine the quality of output and the degree to which the planned goals can be achieved. Particularly in education, experience in process is often taken as a form of educational aims and outcomes. Therefore, education quality defined by this model is mainly the smoothness and health of internal processes and the fruitfulness of learning processes. The process in an education institution generally includes management process, teaching process, and learning process. Thus the selection of indicators may be based on these processes, classified as management quality indicators (e.g. leadership, decision-making), teaching quality indicators (e.g. teaching efficacy, teaching methods), and learning quality indicators (e.g. learning attitudes, attendance rate). Quality assurance by this model is to ensure smooth healthy internal process and fruitful learning experiences. It is also a type of internal quality assurance with emphasis on internal improvement.

The Absence of Problems Model The model assumes that if there is absence of problems, troubles, defects, weaknesses, difficulties, and dyfunctions in an education institution, this institution is of high education quality. Therefore education quality is defined as the absence of problems and troubles inside the education institution. Quality assurance relies heavily on institutional monitoring and reporting to ensure no problems and deficiencies arising from its operation and structure. This is perhaps the oldest concept of internal quality assurance in use in industry (Feigenbaum, 1951). Quality control experts tend to look at quality as less scrap, rework, warranty costs, etc., of the final product. The management team of an education institution may set up stringent quality assurance and monitoring system in order to ensure a deficiency free environment. Identifying strategies for internal improvement of an education institution can be more   precisely done by analyzing problems and defects as opposed to education quality. Therefore, this model is useful particularly when the criteria of education quality are really unclear but the strategies for

internal improvement are needed.

Table 3.   Models of Internal Quality Assurance

	Conception of Quality Assurance	Conditions for Model Usefulness	Indicators / Key Areas for Quality Evaluation (e.g.)
Goal and Specification Model	• Ensuring achievement of stated institutional goals and conformance to given specifications	• When institutional goals and specifications are clear, consensual, time-bound, and measurable; • When resources are sufficient to achieve the goals and conform to the specifications	• Institutional objectives, standards, and specifications listed in the program plans, e.g. academic achievements, attendance rate, dropout rate, etc.
Process Model	• Ensuring smooth internal process and fruitful learning experiences	• When there is a clear relationship between process and educational outcomes	• Leadership, participation, social interactions, classroom climate, learning activities and experiences, etc.
Absence of Problems Model	• Ensuring absence of problems and troubles in the institution	• When there is no consensual criteria of quality but strategies for improvement are needed	• Absence of conflicts, dysfunctions, difficulties, defects, weaknesses, troubles, etc.

Theory of Value-added in Internal Education Quality

The internal quality assurance is based on the theory of value-added in education quality, assuming that the larger the improvement of internal process of teaching and learning, the larger the value-added to education quality. As shown in Figure 2, if the internal process including different components and their relationships can be improved during a time period T1 to T2, the area of value added in quality will increase as the achievement of the planned goals is increased. The larger increase in achievement of planned goals is due to the larger improvement of internal process. Therefore, based on this theory, the component quality approach, the relationship quality or the total internal quality approach can add value in quality if it can improve some or all aspects of the internal process of education.

Figure 2:
Value-Added in Quality
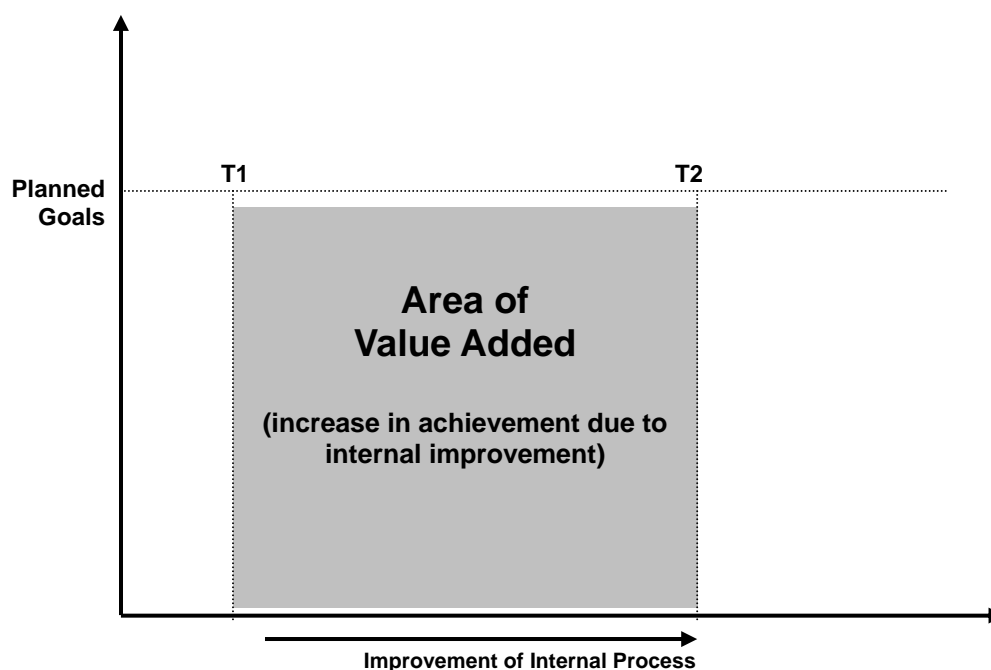
Second Wave: Interface Quality Assurance

In the past decades, numerous initiatives and research projects of the first wave have been conducted to pursue internal school effectiveness & quality in different parts of the world (Cheng & Townsend, 2000). Some focused on improvement of school management and classroom environment(Cheng, 1996b); some on curriculum development and change (Cheng, Chow, & Tsui, 2000); some on teacher qualifications and competencies (Fidler & Atton, 1999); some on improvement of teaching and learning processes (Morgan & Morris, 1999; Bubb, 2001); and some on evaluation and assessment (Macbeath, 1999, 2000; Leithwood, Aithen & Jantzi, 2001; Sunstein, & Lovell, 2000; Headington, 2000). But, unfortunately the results of these efforts were still very limited and could not satisfy the increasing needs and expectations of the public. People began to doubt how effective are these improvement initiatives to meet the diverse needs and expectations of parents, students, employers, policy-makers, and those concerned in the community. How education can be ensured accountable to the public? How are the education practices and outcomes relevant to the changing demands of the local community? All these challenges are in nature concerned with the interface between educational institutions and the community. It means that quality assurance is not only an issue of internal process improvement but also the interface issue of meeting the stakeholders' satisfaction and ensuring accountability to the community.

Interface Quality in Education

Responding to the success of application of new management concepts and the advances of organizational studies in the business and industry world since 1980s, there has been the second wave of education reforms emphasizes interface effectiveness in terms of quality management, stakeholders' satisfaction, market competitiveness and accountability. In

the second wave, the consideration of education quality and its assurance is put into a larger changing social context, in which satisfying the needs of multiple stakeholders and ensuring the accountability of education to the public are crucial criteria for determining education quality. Clearly, the reform focus has shifted from the internal process improvement to the interface effectiveness and adaptation.

In this line of thinking, *education quality* mainly refers to the satisfaction of stakeholders with the education services including education process and outcomes. Accountability of a school or educational institution to the public or key stakeholders is often perceived as important indicator for satisfying the needs of stakeholders. Therefore, *quality assurance* of the second wave reforms often refers to the efforts to ensure education services satisfying the needs of stakeholders and accountable to the public. Therefore it is a type of the *interface quality assurance*.

Institutional monitoring, institutional self-evaluation, quality inspection, use of quality indicators and benchmarks, survey of key stakeholders' satisfaction, accountability reporting to the community, parental and community involvement in governance, institutional development planning, school charter, and performance-based funding are some typical measures used to ensure interface quality in education (Jackson & Lund, 2000; Smith Armstrong, & Brown, 1999; Glickman, 2001; Macbeath, 1999, 2000; Leithwood, Aithen & Jantzi, 2001; Sunstein, & Lovell, 2000; Headington, 2000; Cheng, 1997b).   How to improve the existing structures, processes, and practices in education at different levels to meet stakeholders' needs and expectations is a major concern in the interface quality assurance.

Models of Interface Quality Assurance

As discussed previously, there are eight models of quality assurance in education (Cheng, 1996a; Cheng & Tam, 1997). Among these models, the resource-input model, the satisfaction model, the legitimacy model, the organizational learning model and the total quality management model focus mainly on the interface quality assurance concerning resource input from interface, satisfaction of strategic stakeholders, legitimacy and accountability in the local community, adaptation to the changing interface environment through continuous learning, and total management of internal people and process to meet the strategic stakeholders' needs. The characteristics of quality assurance of these models are summarized as shown in Table 4 and discussed as in the following paragraphs:

The Resource-Input Model This model assumes that scarce and quality resources are necessary for education institutions to achieve diverse objectives and provide quality services in a short time.   Therefore, education quality is perceived as the natural result of achievement of scarce resources and inputs for the institution. Quality assurance refers to the efforts for ensuring different types of quality resource inputs and appropriate environment available to education services and practices. The education quality indicators may include high quality student intake, more qualified staff recruited, better facilities and equipment, better staff-students ratio, and more financial support procured from the central education authority, alumni, parents, sponsoring body or any outside agents.   The capacity of acquiring scarce and quality resources from the interface or outside community represents the potential of an education institution that can promise high education quality particularly in a context of great resource-competition. To some extent, the model redresses the limitation of the above three models of internal quality assurance, linking education quality to the interface of the education institution and the resources input from external environment. Therefore, this

model represents a type of interface quality assurance.

The Satisfaction Model This model assumes that the satisfaction of strategic constituencies of an education institution is critical to its survival in the community. Therefore education quality mainly refers to the extent to which the performance of an education institution can satisfy the needs and expectations of its powerful stakeholders. Education quality may be a relative concept, depending on the expectations of concerned stakeholders. If expected education quality is high and diverse, it will be difficult for institutions to achieve it and satisfy the needs of multiple stakeholders. If expected education quality is low and simple, of course it will be easier for education institutions to achieve it and satisfy the expectations of constituencies stakeholders such that education institutions may be perceived as high quality more easily. Furthermore, the objective measurement of quality achievement is often technically difficult and conceptually controversial. Therefore satisfaction of powerful stakeholders instead of some objective indicators is often used as the critical element to assess quality in education institution. Survey of stakeholders' satisfaction is often used to assess the quality of an institution. Quality assurance by this model relies heavily on the efforts to ensure education practices and services satisfying stakeholders' needs or even beyond their expectations.

Table 4.   Models of Interface Quality Assurance

	Conception of Quality Assurance	Conditions for Model Usefulness	Indicators / Key Areas for Quality Evaluation (e.g.)
Resource-Input Model	• Ensuring achievement of needed quality resources & inputs for the institution	• When there is a clear relationship between inputs and outputs; • When quality resources for the institution are scarce.	• Resources procured for institutional functioning, e.g. quality of student intake, facilities, financial support, etc.
Satisfaction Model	• Ensuring satisfaction of all powerful constituencies	• When the demands of the constituencies are compatible and cannot be ignored	• Satisfaction of education authorities, management board, administrators, teachers, parents, students, etc.
Legitimacy Model	• Ensuring achievement of the institution's legitimate position and reputation	• When the survival & demise among education institutions must be assessed • When the environment is very competitive and demanding	• Public relations, marketing, public image, reputation, status in the community, evidence of accountability, etc.
Organizational Learning Model	• Ensuring adaptation to environmental changes & internal barriers • Continuous improvement	• When institutions are new or changing; • When the environmental change cannot be ignored	• Awareness of external needs and changes, internal process monitoring, program evaluation, development planning, staff development, etc.
Total Quality Management Model	• Ensuring total management of interface, internal people & process with outputs meeting strategic stakeholders' needs	• The constituencies' needs are compatible; the technology & resource are available for total management	• Leadership, people management, strategic planning, process management, quality results, constituencies' satisfaction, impact on society, etc.

The Legitimacy Model   Since the education environment is now very challenging, demanding and competitive, education institutions have to face the external challenges and demands for accountability and "value for money". It is hardly possible for education institutions to continue or survive without ensuring legitimacy in the community. This model assumes that in order to gain legitimacy for survival and to acquire critical resource, education institutions have to win support of the community, build up good public image and show evidence of accountability. Therefore, education quality mainly refers to the achievement of an education's legitimate position or reputation in the community. Quality assurance by this model often relies on the interface activities and achievements such as building up public relations, marketing institutional strengths, ensuring institutional accountability to the public, and promoting institutional image, reputation and status in the community. Also, education institutions should operate educational programs which conform to the ethical and moral norms of the community in order to gain legitimacy. Education institutions are of high education quality if they can survive in a competing environment. The current emphasis on parental choice and accountability in educational reforms in both Western and   Eastern Societies seems to support the importance of the legitimacy model to assessing school education quality.

The Organizational Learning Model   The changing education environment is producing great impacts on nearly every   aspect of functioning in education institutions. This model assumes that responding to changing environment, education quality is a dynamic concept involving continuous improvement and development of members, practices, process, and outcomes of an education institution. A number of researchers have indicated that organizations, like human beings, can be empowered to learn and innovate to provide quality services (Fullan, 1993; Senge, 1990; Schmuck and Runkel, 1985). Quality assurance of this model emphasizes the importance of organizational learning   behavior to ensuring quality in education. Therefore, strategic management, development planning, and staff development are important tools for quality assurance in education (Dempster, et   al. 1993; Hargreaves & Hopkins, 1991).   The indicators of education quality may   include awareness of community   needs   and   changes,   internal   process   monitoring,   program   evaluation, environmental   analysis, professional development, and development planning, etc.

The Total Quality Management Model
Recently there is a rapidly growing emphasis on total quality management in education. are believed to be a powerful tool to enhance education quality and increase school effectiveness (Bradley, 1993; Cuttance, 1994; Greenwood & Gaunt, 1994; Murgatroyd & Morgan, 1993).   The total quality management model defines education quality as the character of the set of elements in the input,   process,   and   output of the education institution that provides services that completely satisfy   both   internal   and external strategic constituencies by meeting their explicit and implicit expectations (Cheng, 1995b). Therefore, quality assurance by this model is mainly the total management of interface, internal people and process with outputs meeting strategic stakeholders' needs. It is believed that improvement of some aspects of the management process is not sufficient to achieve excellence or total quality in performance. The critical elements of total quality management in education institution include strategic stakeholder focus, continuous process improvement, and total involvement and empowerment of school members (Tenner & Detoro, 1992). To a great extent, this model is an integration of the above models, particularly the organizational learning model, the satisfaction model, and the process model. According to the famous Malcolm Baldrige Award framework or the European Quality Award framework for total quality   management,   the   key   areas   for   ensuring   quality   may   include   leadership,   people

management, process management, information and analysis, strategic quality planning, internal constituencies' satisfaction, external constituencies' satisfaction, operational results, students' educational results, and impacts on society (Fisher, 1994; George, 1992) .

Relationship between Internal and Interface Quality Assurance

Each of the above eight models of internal and interface quality assurance (Tables 3 and 4) has its own characteristics, and yet they are inherently linked to each other. Institutional goals can reflect the expectations, needs, and specifications of stakeholders. Ensuring smooth and health internal process and fruitful learning experiences (i.e. the process model) is critical to achieve the institutional goals and produce high quality educational outcomes. The achievement of stated school goals and conformance to given specifications (i.e. the goals and specifications model) can bring satisfaction to the stakeholders (i.e. the satisfaction model). Also, by establishing relationship with the community, building up institutional image, and showing accountability, the education institution can achieve its legitimate position (i.e. the legitimacy model) for institutional survival and quality reputation. Then, by carefully monitoring its programs and checking signs of pitfalls and ineffectiveness, the education institution can ensure that no endemic problem is threatening the quality of education program (i.e. the absence of problems model). Finally, the education institution continues to improve and develop itself in important aspects through learning from its errors and its environment (i.e. the organizational learning model). With the total management of the interface, internal people and process (the total quality management model), then it can achieve all around education quality for students, parents and the community.

In sum, the goal and specification model, the process model and the absence of problem model provides alternative models to conduct internal quality assurance that is the major focus of the first wave reforms. Clearly, as education institutions are in a larger changing social context and education is a service, education quality has to be defined, assessed and managed at the interface of the education institution with the community and diverse key stakeholders. Therefore, the interface quality assurance becomes the core concern of the second wave reforms. The other models including the resource-input model, the satisfaction model, the legitimacy model, the organizational learning model and the total quality management model can provide a wide spectrum of important concepts and approaches to interface quality assurance for meeting diverse needs of strategic stakeholders in the community.

Third Wave: Future Quality Assurance

Towards the Third Wave

In the past decade, there have been numerous education reforms and initiatives following the paradigm of second waves of education reforms. The use of the interface quality assurance models to ensure education quality and effectiveness in a changing and demanding environment and meet the needs of key stakeholders has been very evident and popular in different parts of the world. Even now at the beginning of the new millennium, the second wave is still the major trend of education reforms. Accountability to the public, quality assurance for stakeholders' satisfaction, school monitoring and review, parental choice, student coupon, parental and community involvement in governance, school charter, and performance-based funding have become popular initiatives in education policy making. For example, many countries are now promoting school-based management as the major school reform that include most of these initiatives for ensuring interface quality and effectiveness between the school and the community (Cheng, 1996a).

Recently, the rapid globalization, long lasting impacts of information technology, drastic shocks of the 1997 economic downturn, and strong demands for economic and social developments in both international and regional competitions have stimulated deep reflection on current education reforms in the Asia-Pacific region and other parts of the world. Policy-makers and educators in each country have to think how to reform curriculum and pedagogy and to prepare their young people to more effectively cope with the new era (Dalin & Rust, 1996; Gardner, 1999). Unfortunately, the environment is changing too fast and full of uncertainties and ambiguities. In such a context, most policy-makers and educators get confused with numerous novel but conflicting ideas and lose their directions in the rapid globalization.

They begin to doubt whether the second wave of education reforms can meet the challenges in a new era of globalization, information technology, and new economy. They are concerned with how interface education quality and internal effectiveness are relevant to these challenges. Even though the existing stakeholders are satisfied with the quality of education services and the education institutions are accountable to the community, education is still ineffective or "useless" for our new generations in the new millennium if the aims, content, practices, and outcomes of education are nothing to do with the future needs and challenges in such a rapidly changing environment. Therefore, *education relevance to the future* is one of the critical elements in the discussion of education quality. It means that in addition of internal quality and interface quality, we should have education quality for the future in terms of education relevance. We may define *future education quality* as the relevance of education to the future needs of individuals and the community to meet the coming challenges in the new millennium. Therefore, *future quality assurance* refers to the efforts to ensure the relevance of aims, content, practices, and outcomes of education to the future of new generations in a new era.

In recent few years, more and more countries have started the review of their education systems in the light of future challenges and needs in the new century and initiated the third wave of education reforms. They urged paradigm shift in learning and teaching and promoted reform of different aspects of education in order to ensure the relevance to the new knowledge-driven economy, information technology and globalization and pursue education

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quality for the future (Cheng & Townsend, 2000). This is the start of the third wave of education reforms that is in need of a new theoretical base of future quality assurance. The following paragraphs of this paper intend to clarify what education relevance is important to ensuring future quality in education. In the discussion of future quality and its assurance, there may be two important types of education relevance: "Relevance to New School Functions" and "Relevance to Paradigm Shift in Education" in the new century.

Relevance to School Functions in the New Century

In the new century, schools have different new functions such as technical-economic, human-social, political, cultural, and educational at individual, institutional, community, society, and international levels as shown in Table 5 (Cheng, 1996a). To a great extent, education quality should be intimately linked with the achievement of these school functions. If schools can perform and achieve these school functions, the education service provided by these schools can be perceived as effective and their quality as high. Therefore the effort of quality assurance aims at enhancing effectiveness of teachers and schools to achieve these school functions (Cheng & Walker, 1997; Cheng, 1998).

Technical-economic functions refer to the education system's contribution to the technical or economic developments and needs at each of the five levels. At the individual level, education helps students acquire the knowledge and skills necessary to survive and compete in a modern society. At the institutional level, educational institutions provide quality services for clients, employers and others connected with the organization. At community and societal levels, schools and education institutions aid the economic and instrumental needs of their local community and economy, modify or shape economic behaviors and contribute to the development and stability of the broader society. These then feed the international level through the education system and subsystems providing economically, technologically and environmentally sensitive adults to the constantly shrinking world community. Education relevance to technical-economic functions should be one of the major concerns in current education reforms.

Human-social functions refer to the contribution of the education system to human development and social relationships at different levels of the society. At the individual level, education helps students to develop as fully as possible psychologically, socially and physically. At the institutional level, schools or education institutions help invent and reinforce the quality human relationships which frame organizational behavior. From a Functionalist perspective, education serves certain social functions in their local community. These functions include social integration of diverse constituencies, facilitation of social mobility within existing class structures and reinforcement of social equality. From the alternative viewpoint of Conflict Theory, education reproduces the existing social class structure and perpetuates social inequality (Cheng, 1995a; Blackledge & Hunt, 1985). Due to the growing global consciousness (Beare & Slaughter, 1993), education needs to prepare students for international harmony, social co-operation, global human relationships, and work toward the elimination of national, regional, racial, and gender biases at the international level. Given the importance of human-social functions of education to developments at different levels, how to ensure education relevance and quality in this aspect is often the hot topic in education policy making and debate.

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Table 5.   Relevance to Multiple School Functions at Multi-levels

	Technical-Economic Functions	Human-Social Functions	Political Functions	Cultural Functions	Educational Functions
Individual	• Knowledge & skills training • Career training	• Psychological developments • Social developments • Potential developments	• Development of civic attitudes and skills	• Acculturation • Socialization with values, norms, & beliefs	• Learning how to learn & develop • Learning how to teach & help • Professional development
Institutional	• As a life place • As a work place • As a service organization	• As a social entity/system • As a human relationship	• As a place for political socialization • As a political coalition • As a place for political discourse or criticism	• As a centre for cultural transmission & reproduction • As a place for cultural re-vitalization & integration	• As a place for learning & teaching • As a centre for disseminating knowledge • As a centre for educational changes & developments
Community	• Serving the economic or instrumental needs of the community	• Serving the social needs of the community	• Serving the political needs of the community	• Serving the cultural needs of the community	• Serving the educational needs of the community
Society	• Provision of quality labor forces • Modification of economic behavior • Contribution to the manpower structure	• Social integration • Social mobility/ social class perpetuation • Social equality • Selection & allocation of human resources • Social development & change	• Political legitimization • Political structure maintenance & continuity • Democracy promotion • Facilitating political developments & reforms	• Cultural integration & continuity • Cultural reproduction • Production of cultural capital • Cultural revitalization	• Development of the education professions • Development of education structures • Dissemination of knowledge & information • Learning society
International	• International competition • Economic co-operation • International trade • Technology exchange • Earth protection • Sharing information	• Global village • International friendship • Social co-operation • International exchanges • Elimination of national /regional /racial /gender biases	• International coalition • International understanding • Peace/ against war • Common interests • Elimination of conflicts	• Appreciation of cultural diversity • Cultural acceptance across countries/regions • Development of global culture	• Development of global education • International education exchanges & co-operation • Education for the whole world

adopted from Cheng (1996a)

Political functions refer to the contribution of the education system to the political developments at different levels of society. At the individual level, education helps students to develop positive civic attitudes and skills and to exercise the rights and responsibilities of citizenship. At the institutional level, education institutions act as places for encouraging critical discussion of political issues. At the community and societal levels, education plays an important role in promoting awareness of democracy and facilitating political developments and changes. The growing awareness of international dependence reinforces the need for education to contribute to international understanding and elimination of international conflict. Responding to the increasing emphasis on democracy and harmony at different levels in the new century, the education relevance to political functions become a necessary part of future quality assurance.

Cultural functions refer to the contribution of the education system to the cultural transmission and development at different levels of society. At the individual level, education helps students to develop creativity and aesthetic awareness, and to become familiar with the dominant values underpinning their society. At an institutional level, education institutions act as agents for systematic cultural transmission, cultural integration among their multiple and diverse constituencies, and cultural re-vitalization. At the community and society levels, education institutions often serve as a cultural unit carrying the explicit norms and expectations of the local community. Again, Conflict Theory provides an alternative view. It suggests that schools and teachers socialize students from different levels of society with different sets of values and beliefs and, in the process, benefit some groups more than others. At the international level, education can encourage appreciation of cultural diversity and acceptance of different norms, traditions, values, and beliefs in different countries and regions. For the long term development of individuals, the community, the society or the whole world, the education relevance to cultural functions is inevitably a key concern in future quality assurance.

Education functions refer to the contribution of the education system to the development and maintenance of education at different levels. Traditionally, education has been perceived as a means to achieving the economic, social, political, and cultural values only. Rapid and widespread change, however, has prompted now an acceptance that education in and of itself is a crucial goal. The content, system, and structure of education, then, need to be developed and maintained. At the individual level, education helps students to learn how to learn, and teachers to learn how to teach. At the institutional level, education institutions serve as a place for professionals working together to improve learning and teaching through mutual support and shared innovation. At the community and society levels, education provides services for different educational needs within their communities, facilitate developments of education as a profession, disseminate knowledge and information to the next generation, and contribute to the formation of a learning society. In order to encourage mutual understanding among nations, education can contribute to the development of global education and international education exchange and co-operation. The increasing importance of continuous life long learning to the future development reinforces the relevance to education functions as necessary component in quality assurance.

The knowledge of above school functions and accompanying levels is crucial for quality assurance. It provides a frame for school managers and teachers to understand and operationally education programs relevant to the new school functions at different levels. Now many education institutions narrow their focus only on some of school functions such

as technical-economic functions or human-social functions but ignore the other. Some emphasize school functions only on the individual and institutional levels but neglect the community, society and international levels. The biased emphasis or narrowed focus may hinder their efforts to pursue future quality in education.

Relevance to Paradigm Shift in Education

New Paradigm: Triplization in Education

Different parts of the world are now in the process of globalization in technological, economic, social, political, cultural, and learning aspects (Cheng, 1999). The world is moving very fast to become a global village, in which different parts of the world are rapidly networked and globalized through internet and different types of IT, communications, and transportation (Albrow, 1990; Naisbitt, & Aburdence, 1991). Most countries and regions have more and more common concerns and sharing. Also, the interactions between nations and people become boundless, multi-dimensional, multi-level, fast, and frequent. They become more and more mutually dependent with international collaborations, exchanges, and interflows. According to Cheng (1999, 2000), the human nature in a social context of the new millennium will be a multiple person, as technological person, economic person, social person, political person, cultural person, and learning person in a global village of information, high technology, and multi-cultures. Both individuals and the society need multiple developments in the technological, economic, social, political, cultural, and learning aspects. Life-long learning and learning society (or knowledge society) are necessary to sustain the continuous multiple developments of individuals and the society in a changing new century (Drucker, 1993, 1995). The society has to become towards a multiple intelligence society that can provide the necessary knowledge and intelligence base and driving force to support the multiple developments. And the individuals have to become towards a multiple intelligence citizen who can contribute to the development of a multiple intelligence society.

In such a context, there is an emerging paradigm shift in education. According to Cheng (1999, 2000), the paradigm should be shifted from the *Traditional Site-bounded Paradigm* to *a New Triplization Paradigm*. The new paradigm will emphasize the development of students' contextualized multiple intelligences (CMI) (including technological, economic, social, political, cultural, and learning intelligences) and the processes of triplization (including globalization, localization and individualization) in education.

Globalization: It refers to the transfer, adaptation, and development of values, knowledge, technology and behavioral norms across countries and societies in different parts of the world. The typical phenomena and characteristics associated with globalization include growth of global networking (e.g. internet, world wide e-communications, and transportations), global transfer and interflow in technological, economic, social, political, cultural, and learning aspects, international alliances and competitions, international collaboration and exchange, global village, multi-cultural integration, and use of international standards and benchmarks.

Implications of globalization for education should include maximizing the global relevance, support, intellectual resources, and initiative in schooling, teaching, and learning

(Caldwell & Spinks, 1998; Daun, 1997). Some examples of globalization in education are web-site learning; learning from the Internet; international visit/immersion programs; international exchange programs; international partnership in teaching and learning at the group, class, and individual levels; interactions and sharing through video-conferencing across countries, communities, institutions, and individuals; and new curriculum content on technological, economic, social, political, cultural, and learning globalization.

Localization: It refers to the transfer, adaptation, and development of related values, knowledge, technology, and behavioral norms from/to the local contexts. It has two types of meanings: first, it can mean the adaptation of all related external values, initiatives, and norms to meet the local needs at the society, community, or site levels; second, it can also mean the enhancement of local values, norms, concern, relevance, participation, and involvement in the related initiatives and actions. Some characteristics and examples of localization are as follows: local networking; adaptation of external technological, economic, social, political, cultural, and learning initiatives to local communities; decentralization to the community or site level; development of indigenous culture; meeting community needs and expectations; local involvement, collaboration, and support; local relevance and legitimacy; and concern for school-based needs and characteristics and social norms and ethos (Tam, Cheng, & Cheung, 1997; Kim, 1999; Cheng, 1998).

The implications of localization to education are to maximize the local relevance, community support, and initiative in schooling, teaching, and learning. Some examples for practice of localization include community and parental involvement in school education; home-school collaboration; assurance of school accountability; implementation of school-based management, school-based curriculum, and community-related curriculum; and development of new curriculum content on technological, economic, social, political, cultural, and learning localization.

Individualization: It refers to the transfer, adaptation, and development of related external values, knowledge, technology, and behavioral norms to meet the individual needs and characteristics. The importance of individualization to human development and performance is based on the concerns and theories of human motivation and needs (e.g. Maslow, 1970; Manz, 1986; Manz & Sims, 1990; Alderfer, 1972). Some examples of individualization are the provision of individualized services; emphasis of human potentials; promotion of human initiative and creativity; encouragement of self-actualization; self-managing and self-governing; and concern for special needs. The major implication of individualization in education is to maximize motivation, initiative, and creativity of students and teachers in schooling, teaching, and learning through such measures as implementing individualized educational programs; designing and using individualized learning targets, methods, and progress schedules; encouraging students and teachers to be self learning, self actualizing, and self initiating; meeting individual special needs; and developing students' contextualized multiple intelligences.

With the concepts of triplization, students, teachers, and schools can be considered to be *globalized, localized, and individualized during the process of triplization*. Or, simply, they are *triplized*.

Paradigm Shift in Learning

With the concept of triplization in education, there is a clear paradigm shift in learning. Some key features of the new and traditional paradigms in learning are summarized in Table 6 (Cheng, 1999, 2000a).

New Paradigm of Learning.   The new paradigm of school education prescribes that students and their learning should be individualized, localized, and globalized.   Student is the centre of education.   "Individualized Student and Learning" means that students and their learning should be facilitated in a way such that all types of transfer, adaptation, and development of related values, knowledge, technology, and norms during learning process can meet their needs and personal characteristics, and that their potentials, particularly CMI, can be optimally realized.   Different students can learn in different style.   Individualized and tailor-made programs (including targets, content, methods, and schedules) for different students is necessary and feasible.   Students can be self-motivated and self-learning with appropriate guidance and facilitation.   Learning is a process of self-actualizing, discovering, experiencing, and reflecting.   Since the information and knowledge are accumulated in a unbeliverable speed but outdated very quickly, it is almost impossible to make any sense if education is mainly to deliver skills and knowledge, particularly when students can find out the knowledge and information easily with the help of IT and the Internet.   Therefore, the new century paradigm emphasizes that the focus of learning is on how to learn, think, and create.   In order to sustain learning as life long, learning should be facilitated as enjoyable and self-rewarding.

Table 6: Paradigm Shift in Learning

New Triplization Paradigm	Traditional Site-Bounded Paradigm
Individualized Learning:	**Reproduced Learning**:
• Student is the centre of education	• Student is the follower of teacher
• Individualized programs	• Standard programs
• Self-learning with appropriate guidance and facilitation	• Absorbing knowledge from their teachers
• Self-actualizing process	• Receiving process
• Focus on how to learn	• Focus on how to gain
• Self-rewarding and enjoyable	• External rewarding and punishment avoiding
Localized and Globalized Learning:	**School-Bounded Learning:**
• Multiple local and global sources of learning	• Teacher-based learning
• Networked learning	• Separated learning
• Life-long and everywhere	• Fixed period and within school
• Unlimited opportunities	• Limited opportunities
• World-class learning	• School bounded learning
• Local and international outlook	• School experiences

Students and their learning should be globalized and localized in such a way that local and global resources, support, and networks can be brought in to create and materialize the opportunities for students' developments during their learning process.   Through localization and globalization, students can learn from multiple sources inside and outside their schools, locally and globally, not limited to a small number of teachers in their schools.   Participation in local and international learning programs can help them achieve the community experiences and global outlook beyond schools.   Also their learning is a type of networked learning. They will be grouped and networked locally and internationally.   Learning groups and

networks will become a major driving force to sustain the learning climate and multiply the learning effects through mutual sharing and inspiring. We can expect that each student can have a group of life-long partner students in different corners of the world to share their learning experiences.

It is expected that learning happens everywhere and is life long. School education is just the start or preparation for life-long learning. Learning opportunities are unlimited. Students can maximize the opportunities for their learning from local and global exposures through the Internet, Web-based learning, video-conferencing, cross-cultural sharing, and the using of different types of interactive and multi-media materials (Education and Manpower Bureau, 1998). Students can learn from the world-class teachers, experts, peers, and learning materials from different parts of the world. In other words, their learning can be a world-class learning.

Traditional Paradigm of Learning. In the traditional thinking, students and their learning are part of the reproduction and perpetuation process of the existing knowledge and manpower structure to sustain developments of the society, particularly in the social and economic aspects (Blackledge & Hunt, 1985; Cheng & Ng, 1992; Hinchliffe, 1987; McMahon, 1987). It is not a surprise that education is perceived as a process for students and learning being "reproduced" to meet the needs of the society.

In school education, students are the followers of their teacher. Available to students are standard programs of education, in which students can be taught in the same way and same pace even though their ability may be different. Individualized programs seem to be unfeasible. The learning process is characterized by absorbing certain types of knowledge, and students are "students" of their teachers and absorb knowledge from their teachers. Learning is a disciplinary, receiving, and socializing process such that close supervision and control on the learning process are necessary. The focus of learning is on how to gain some knowledge and skills. Learning is often perceived as hard working activities for achieving external rewards and avoid punishment.

In the traditional paradigm, all learning activities are school-bounded and teacher-based. Students learn from a limited numbers of school teachers and their prepared materials. Therefore, teachers are the major source of knowledge and learning. Students learn the standard curriculum from their textbooks and related materials assigned by their teachers. Students are often arranged to learn in a separated way and are kept responsible for their individual learning outcomes. They have few opportunities to mutually support and learn. Their learning experiences are mainly school experiences alienated from the fast changing local and global communities. Learning happens only in school within a given school time frame. Graduation tends to be the end of students' learning.

There are also paradigm shifts in teaching and schooling. For the detail, please see Cheng (1999, 2000a).

Paradigm Shifts in Quality Assurance

Given the paradigm shifts in learning, teaching, and schooling, there is also corresponding paradigm shift in quality assurance.

Since the traditional paradigm emphasizes the delivery of knowledge and skill, the quality assurance of education is often focused on the following questions:
1. How well learning and teaching be organized to deliver the necessary knowledge and skills to students;
2. How well the delivery of knowledge and skills to students can be ensured through the improvement of teaching and learning;
3. How well teachers' teaching can be improved in a given time period;
4. How well students can arrive at a given standard in teaching examinations;
5. How well the performance of teaching and the outcomes of learning can satisfy the key stakeholders' expectations and needs; and
6. How accountable the education services can be to the public and stakeholders.

Clearly, the first four questions are concerned with internal quality assurance that focus on the internal improvement in teaching, learning, and delivery of knowledge and skills. The last two questions come from the concern of interface quality assurance that focuses on the stakeholders' satisfaction with the performance and learning outcomes and the education accountability to the public. In other words, the traditional paradigm reflects the line of thinking of the first and second waves.

But the paradigm shift towards triplization induces a new conception of quality assurance of education because the aims, content, and process of education are completely the traditional thinking. The new quality assurance can be based on the following major questions:

1. How well learning, teaching, and schooling are triplized?

This question aims to ensure that student learning, teacher teaching, and schooling can be well placed in a globalized, localized, and individualized context. Only internal improvement in teaching, learning, and schooling is not sufficient to ensure education relevance to the globalization, localization, and individualization for the future development of students. Also satisfaction of stakeholders and accountability at the interface of education institution may contribute to localization of education but cannot promise globalization and individualization.

2. How well students' learning opportunities are maximized through the IT environment, networking, CMI teachers, and CMI schools?

This question intends to ensure the maximizing of opportunities for students' learning and development in a triplized CMI environment. The concern is not on how much internal process can be improved and how much stakeholders are satisfied, but on how large and how many opportunities can be created for students' learning and development of their CMI.

3. How well students' self learning is facilitated and sustained as potentially life long?

This question tries to ensure the maximized opportunities for students' self-learning are sustainable to life long. Short term internal improvement and short term stakeholders'

satisfaction may not be so important and relevant to the future of students if students themselves cannot sustain their learning as a life long process.

4. How well students' ability to triplize their self learning is developed ?

This question aims to ensure the relevance of student learning to the development of their ability of triplizing self-learning. It is very important and necessary for students to achieve their own ability for maximizing learning opportunities and sustaining their self learning through globalization, localization and individualization.

5. How well students' CMI is continuously developed by themselves?

The question focuses on ensuring the outcomes of learning and teaching fundamentally relevant to the development of students' contextualized multiple intelligences including technological, economic, social, political, cultural, and learning intelligences that are crucial for them to meet the challenges in the future. This is the main concern.

From the above discussion, the implications for paradigm shift in quality assurance are substantial. In order to ensure education relevance to the future for the new generations in the new century, education should move towards development of students' contextualized multiple intelligences and triplization in education including globalization, localization, and individualization.
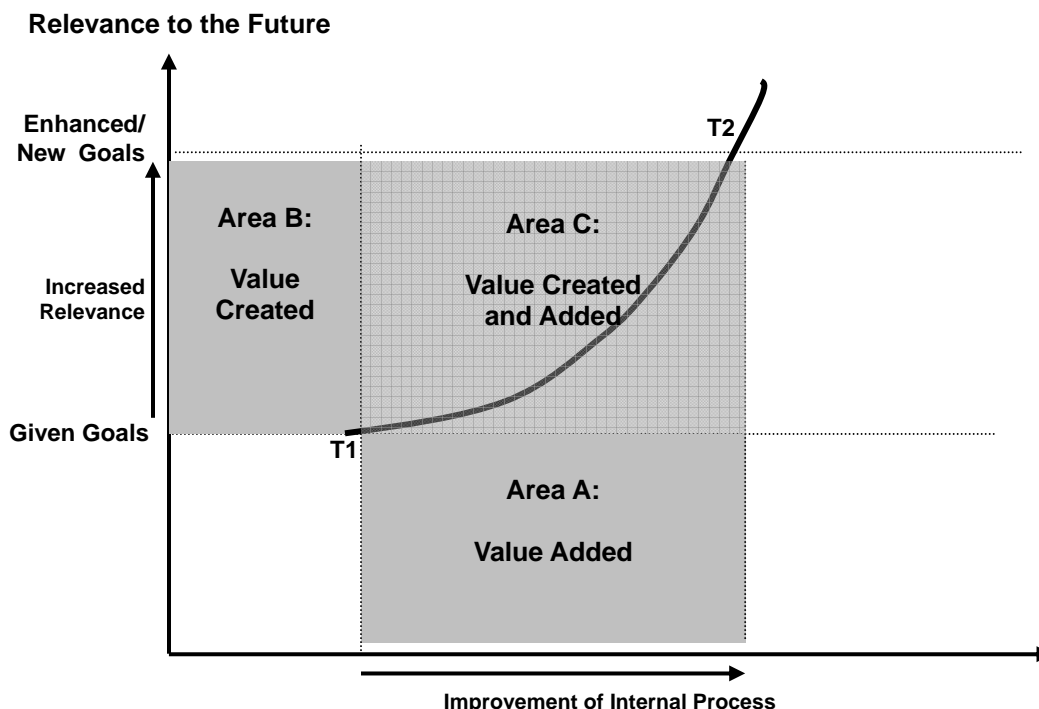
Theory of Value-Created in Education Quality

Value added to Internal and Interface Quality. As discussed previously, the quality assurance of the first wave is based on the theory of value added, that is dependent of the improvement of internal process including learning, teaching and management to maximize the achievement of planned goals. As shown in Figure 3, area A is the value added between time T1 and T2 due to the improvement of internal process. If the planned goals are consistent with the key stakeholders' needs and expectations, then the internal quality assurance is consistent with the interface quality assurance. And the value added to internal quality through internal improvement is also the value added to interface quality. But if the planned goals are not the key stakeholders' goals or needs, then the value added to internal quality does not promise the value added to interface quality.

Value Created to Future Quality and Interface Quality. If an education institution can increase education relevance or create enhanced goals during time T1 and T2, then new value can be created in education quality as shown in area B of Figure 3. This is *the theory of value created.* The future quality assurance is based on this theory with focus on creating value through enhancement of education relevance to the future. If the enhanced goals can meet the stakeholders' expectations or even beyond, then the value created in future quality is also the value created in interface quality. In this case, the future quality assurance is consistent with the interface quality assurance. Of course, if the enhanced goals are not the stakeholders' needs, there may be no value created to the interface quality.

If the improvement of internal process and the enhancement of education relevance can be achieved at the same time, there will be more value added and created to education quality as shown in area C of Figure 3.

Figure 3:
Value Created and Added in Quality

Relevance to the Future

Area B:
Value
Created

Area C:
Value Created
and Added

Enhanced/
New Goals

T2

Increased
Relevance

Given Goals

T1

Area A:
Value Added

Improvement of Internal Process

Conclusion

From the above discussion, we can see that the three waves of education reforms in fact represent different paradigms in conceptualization and assurance of education effectiveness and quality. The major characteristics of these three paradigms can be summarized as shown in Table 7.

Three Paradigms of Quality Assurance

The first wave of education reforms emphasizes internal improvement and effectiveness. Therefore the paradigm of quality assurance in education conceptualizes education quality mainly as the internal effectiveness of management, teaching, and learning to achieve the planned goals. Quality assurance is defined as the efforts to improve internal environment and processes such that the effectiveness of learning and teaching can be ensured to achieve the planned goals of the education institution. Based on the structure of effectiveness in classroom, there are two major approaches that can be used to conceptualize internal improvement for education quality. The component quality approach focuses on improvement of the quality of some components of the effectiveness and the relationship approach on improvement of the quality of relationships between components. In practice, there are three models often used to enhance internal quality in education, including the goal and specification model, the process model, and the absence of problem model. The efforts of quality assurance are often short-term orientation, related to the daily practices and improvement in management, teaching, and learning. Each model has its own characteristics

to manage internal improvement for quality in education. Basically, the internal quality assurance is based on the theory of valued added in quality.

The second wave of education reforms and quality assurance focuses on the interface between the education institution and the community. Education quality is interface quality, mainly defined and assessed by the satisfaction of stakeholders with the education services including education process and outcomes. Accountability to the public and stakeholders is also the key quality indicator. Therefore quality assurance is to ensure education services satisfying the needs of stakeholders and accountable to the public. Depending on the approaches used to deal with interface issues and achieve interface quality in education, there are five models for interface quality assurance, including the resource-input model, the satisfaction model, the legitimacy model, the organizational learning model, and the total quality management model. All these models have been used widely in the business sector and now they have received increasing attention and application in the education sectors following the movements of school-based management, education accountability, and privatization and marketization in education. Compared with the short-term focus of internal quality assurance, the efforts of interface quality assurance are middle-term orientation, interacting with the interface and external environment of the education institution. The interface quality assurance can be based on the theory of value added, the theory of value created, or both, depending on whether the planned goals are the stakeholders' expectations or not.

Responding to the challenges of globalization, information technology and knowledge-driven economy in the new millennium, the third wave of education reforms urges paradigm shift in quality assurance in education. Education quality is future quality that is defined by the education relevance to the future needs of individuals, the community, and the society. Therefore, future quality assurance is to ensure the relevance of aims, content, practices, and outcomes of education to the future of new generations in facing up challenges of new millennium. There are two main types of education relevance. First, the relevance to new school functions in the new century includes technical-economic functions, human-social functions, political functions, cultural functions, and education functions. And second, the relevance to the paradigm shifts in education should including emphasis on the development of students' contextualized multiple intelligences and triplization in education for creating unlimited opportunities for students' continuous life-long learning and development. Compared with the internal and interface quality assurance, the efforts of future quality assurance are mainly long-term orientation no matter for development of individuals, the community and the society. Also, triplization including globalization, localization, and individualization in education is crucial process for ensuring education relevance and future quality. Clearly, the theory of future quality assurance is based on value created through enhancement of education relevance and creation of new goals, that is different from the theory of value added through internal improvement.

Table 7:   Three Different Paradigms of Quality Assurance in Education

|	First Wave Paradigm	Second Wave Paradigm	Third Wave Paradigm
Conception of Education Quality	**Internal Quality:** As education effectiveness to achieve planned goals	**Interface Quality:** As satisfaction of stakeholder with the education services including education process and outcomes; and as accountability to the public	**Future Quality:** As education relevance to the future needs of individuals, the community, and the society
Quality Assurance	**Internal Quality Assurance:** Improving the internal environment and processes such that the effectiveness of learning and teaching can be ensured to achieve the planned goals	**Interface Quality Assurance:** Ensuring education services satisfying the needs of stakeholders and accountable to the public	**Future Quality Assurance:** Ensuring the relevance of aims, content, practices, and outcomes of education to the future of new generations in a new era of globalization, information technology, and knowledge-driven economy
Major Approach/Model of Quality Assurance	**Approaches**: • Component Quality Approach • Relationship Quality Approach **Internal Models:** • Goal and specification model • Process model • Absence of problem model	**Interface Models:** • Resource-input model • Satisfaction model • Legitimacy model • Organizational learning model • Total quality management model	**Relevance to New School Functions:** • Technical-economic functions • Human-social functions • Political functions • Cultural functions • Education functions **Relevance to Paradigm in Education:** • Development of contextualized multiple intelligences • Triplization in education: Globalization, localization and individualization
Main Questions for Management and Practice	• How well learning, teaching, and schooling are organized to deliver knowledge and skills? • How well the delivery of knowledge can be ensured through the improvement of schooling, teaching, and learning? • How well teachers' teaching can be improved and developed in a given time period? • How well students can arrive at a given standard in examination?	• How well the performance of teaching and the outcomes of learning can meet the stakeholders' expectations and needs? • How accountable the education services can be to the public and stakeholders?	• How well learning, teaching, and schooling are triplized? • How well students' learning opportunities are maximized through IT environment, networking, CMI teachers, and CMI school? • How well students' self-learning is facilitated and sustained as potentially life long? • How well students' ability to triplize their self-learning is developed? • How well students' CMI is continuously developed by themselves?
Tine Frame of QA	Short-term Orientation	Middle-term Orientation	Long-term Orientation
Theory of Value Added / Created	Theory of value-added in internal quality	Theory of value-added and value-created in interface quality	Theory of value-created in future quality

Total Quality Assurance in Education

Although internal quality assurance, interface quality assurance, and future quality assurance are based on different paradigms and they have different strengths and focuses, all of them are important and necessary to provide us a comprehensive framework to consider and manage education quality in the new century. They are mutually supplementary to each other, taking internal improvement, interface satisfaction and accountability, and future relevance into consideration. We can believe, if an education institution can ensure internal quality, interface quality, and future quality, they are in *total quality assurance* in education.

From this line of thinking, the efforts in ongoing education reforms should focus not only on interface quality assurance and internal quality assurance but also on future quality assurance in order to achieve total quality in education.

Given the constraints of time framework and resources, it is often unrealistic to expect an education institution to maximize the achievement of internal quality, interface quality, and future quality at the same time, in a short time, or all the time in such a rapidly changing education environment. But, according to the dynamic concept proposed in Cheng (1996a), an education institution can struggle and learn to become effective to provide services of high internal quality, interface quality, and future quality in a dynamic way in a longer time span, as shown in Figure 4. During the early stage between time t1 and t2, the education institution may not achieve high total quality in education in a short time. But, if they can continuously learn and develop to pursue all these three types of quality assurance, the quality of their education services can be maximized towards higher total quality in the later stage as shown in time t3 to t4.

It is hoped that the three paradigms of quality assurance in education as well as the conception of total quality in terms of internal quality, interface quality and future quality can provide a new comprehensive framework for educators, researchers, and policy-makers in different parts of the world to pursue quality education in the new century.

Figure 4. Maximizing Total Quality in Education through a Spiral Path
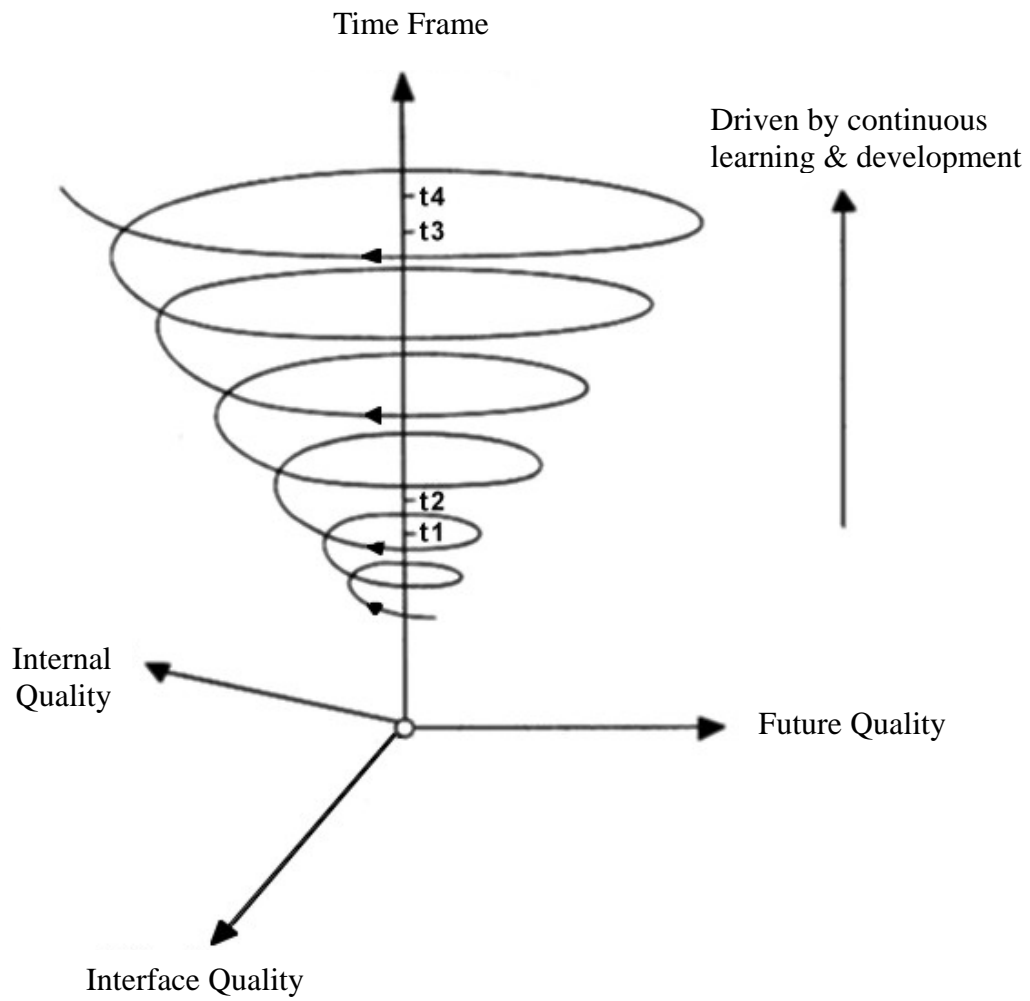
References

Albrow, M. (1990). Introducton, In M.Albrow & E. King(eds.), *Globalization, knowledge and society*. London: Sage.

Alderfer, C. P. (1972). *Existence, relatedness, and growth: Human needs in organizational settings*. New York: Free Press.

Beare, H., & Slaughter, R. (1993). *Education for the twenty-first century*. London: Routledge.

Blackledge, D., & Hunt, B. (1985). *Sociological interpretations of education*. Sydney: Croom Helm.

Bogan, C. E. & English, M.J. (1994). *Benchmarking for best practices*. New York: McGraw-Hill.

Bradley, L. H. (1993). *Total quality management for schools*. Lancaster, PA: Technomic.

Bubb, S. (2001). *Performance management: monitoring teaching in the primary school*. UK: David Fulton Publishers.

Burbules, N.C. & Torres, C.A. (Eds) (2000). *Globalization and education: critical perspectives*. New York: Routledge.

Caldwell, B.J. & Spinks, J.M. (1998). *Beyond the self-managing school*. London: Falmer Press.

Cheng, Y.C. (1995a), *Function and Effectiveness of Education*, (3rd ed.), Hong Kong: Wide Angle Press

Cheng, Y.C. (1995b). School Educational Quality: Conceptualization, Monitoring, & Enhancement. In P.K. Siu & P. Tam (eds.), *Quality in Education: Insights from Different Perspectives*, (pp.123-147). Hong Kong: The Hong Kong Educational Research Association.

Cheng, Y.C. (1996a). *School Effectiveness and School-based Improvement: A Mechanism for Development*. London, UK: Falmer Press. (Korean Edition: Translated by Professor Chong-yul Park and Soon-nam Kim of Kyungpook National University, Tawgu, Korea and published by the Won-Mi Publishing Co. Korea in 2001, pages 1-355; Chinese Edition: published by Taiwan Pschological Publishing Co. 2001 in press)

Cheng, Y.C. (1996b). *The improvement of school management: Theory, Change and Practice*. Hong Kong: Hong Kong Institute of Educational Research, Chinese University of Hong Kong.

Cheng, Y.C. (1997a). *Monitoring School Effectiveness: Conceptual and Practical Dilemmas in Developing a Framework*. Eugene, OR: ERIC (Educational Resources Information Center) (no. EA 028359). Clearinghouse on Educational Management. (USA). (In H. Meng, Y. Zhou, & Y. Fang (eds.) *School Based Indicators of Effectiveness: Experiences and Practices in APEC Members*. (pp.197-206), China: Guangxi Normal University Press)

Cheng, Y.C. (1997b). *A Framework of Indicators of Education Quality in Hong Kong Primary Schools: Development and Application. Eugene,* OR: ERIC (Educational Resources Information Center) (no. EA 028358). Clearinghouse on Educational Management. (USA). (In H. Meng, Y. Zhou, & Y. Fang (eds.) *School Based Indicators of Effectiveness: Experiences and Practices in APEC Members*. (pp.207-250), China: Guangxi Normal University Press.)

Cheng, Y.C. (1998). The Pursuit of a New Knowledge Base for Teacher Education and Development in the New Century. *Asia-Pacific Journal of Teacher Education and Development,* 1(1), 1-16.

Cheng, Y.C. (1999). *Curriculum and Pedagogy in New Century: Globalization, Localization and Individualization for Multiple Intelligences*. Keynote speech presented at the 5th

UNESCO-ACEID International Conference "Reforming Learning, Curriculum and Pedagoy: Innovative Visions for the New Century", 13-16 December, 1999, Thailand.

Cheng, Y.C. (2000). *Globalization, Localization and Individualization for Effective Education.* Keynote speech presented at the 14th International Congress for School Effectiveness and Improvement " Global Networking for Quality Education", 4-8 January 2000, Hong Kong.

Cheng, Y.C. (2000a). A CMI-Triplization Paradigm for Reforming Education in the New Millennium. *International Journal of Educational Management.* 14(4), 156-174.

Cheng, Y.C. (2000b). Educational Change and Development in Hong Kong: Effectiveness, Quality, and Relevance, In Townsend, T & Cheng, Y.C. (eds), *Educational Change and Development in the Asia-Pacific Region: Challenges for the Future.* (pp.17-56) The Netherlands: Swets and Zeitlinger Publisher.

Cheng, Y.C. (2001a). *Educational Relevance, Quality and Effectiveness: Paradigm Shifts.* Invited keynote speech presented at the International Congress for School Effectiveness and School Improvement held in 5-9 January 2001 in Toronto, Canada, with the theme "Equity, Globalization, and Change: Education for the 21st Century".

Cheng, Y.C. (2001b). New Education and New Teacher Education: A Paradigm Shift for the Future. In Cheng, Y.C., Chow, K.W., & Tsui, K.T. (eds.). *New Teacher Education for the Future: International Perspectives*, (pp. 33-88). Hong Kong & The Netherlands: Hong Kong Institute of Education & Kluwer Academic Puhlishers.

Cheng, Y.C. (2001c). *Towards the Third Wave of Education Reforms in Hong Kong.* Keynote speech at the International Forum on Education Reforms in the Asia-Pacific Region, held in 14-16 February 2001, Hong Kong.

Cheng, Y.C., Chow, K.W. & Tsui, K.T. (eds.) (2000). *School Curriculum Change and Development in Hong Kong.* Hong Kong: Hong Kong Institute of Education. pp. 1-591.

Cheng, Y. C., & Ng, K. H. (1992). Economic considerations in educational policy analysis: A preliminary frame-work. *Primary Education, 3*(1), 55-64.

Cheng, Y.C. & Tam, W.M. (1997). Multi-models of Quality in Education. *Quality Assurance in Education*, 5(1), 22-31.

Cheng, Y.C. & Townsend, T. (2000). Educational Change and Development in the Asia-Pacific Region: Trends and Issues, In Townsend, T & Cheng, Y.C. (eds), *Educational Change and Development in the Asia-Pacific Region: Challenges for the Future.* (pp.317-344) The Netherlands: Swets and Zeitlinger Publisher.

Cheng, Y.C. & Walker, A. D. (1997). Multi-functions of School-based Teacher Education. *International Journal of Educational Management.* 11 (2), 80-88.

Coniam, D., Falvey, P., Bodycott, P., Crew, V., Sze, P.M.M. (2000). Establishing English language benchmarks for primary teachers of English language: A report to ACTEQ. Hong Kong: Advisory Committee of Teacher Education and Qualification.

Coulson, A. J. (1999). *Market Education: the unknown history.* New Brunswick, N.J.: Transaction Publishers.

Cuttance, P. (1994). Monitoring educational quality through performance indicators for school practice. *School Effectiveness and School Improvement, 5*(2), 101-126.

Dalin, P. & Rust, V.D. (1996). *Towards schooling for the twenty-first Century.* New York: Cassell.

Daun, H. (1997). National forces, globalization and educational restructuring: some European response patterns. *Comapre, 27*(1), 19-41.

Daun, H. (2001). *Educational Restructuring in the Context of Globalization and National Policy.* US: Routledge Falmer.

Dempster, N., Sachs, J., Distant, G., Logan, L., & Tom, C. (1993, January). *Planning in*

primary schools: A national study in Australian schools. Paper presented at the International Congress for School Effectiveness and Improvement, Norrkoping, Sweden.

Drucker, P.F. (1993). *Post-capitalist society*. New York: Harper Business.

Drucker, P.F. (1995). *Managing in a time of great change*. Oxford: Butterworth Heinerman.

Education and Manpower Bureau (1998 November). *Information technology for learning in a new era: Five-year strategy 1998/99 to 2002/03*. Hong Kong: Government Printer.

Evans, G.R. (1999). *Calling academia to account: rights and responsibilities.* Buckingham, Great Britain: Society for Research into Higher Education & Open University Press.

Feigenbaum, A.V. (1951). *Quality control: Principles, practice, and administration*. New York: McGraw-Hill.

Fidler, B. & Atton, T. (1999). *Poorly performing staff in schools and how to manage them: capability, competence and motivation*. London: Routledge.

Fisher, D. C. (1994). *Measuring up to the Baldrige*. New York: American Management Association.

Fullan, M. (1993). *Change forces*. London: Falmer Press.

Gardner, H. (1999). *The disciplined mind: What all students should understand*. New York: Simon & Schuster.

George, S. (1992). *The Baldrige quality system*. New York: Wiley.

Glickman, C.D. (2001). Holding Sacred Ground: The Impact of Standardization. *Educational Leadership*, 58(4), 46-51.

Goertz, M.E. & Duffy, M.C. (2001). *Assessment and Accountability Systems in the 50 States, 1999-2000*. CPRE Research Report Series.

Greenwood, M. S., & Gaunt, H. J. (1994). *Total quality management for schools.* London: Cassell.

Hargreaves, D. H., & Hopkins, D. (1991). *The empowered school.* UK: Cassell.

Headington, R. (2000). *Monitoring, assessment, recording, reporting and accountability: meeting the standards*. London: David Fulton.

Heller, D.E. (Ed)(2001). *The states and public higher education policy: affordable, access, and accountability.* Baltimore: John Hopkins University Press.

Hinchliffe, K. (1987). Education and the labor market. In G. Psacharopoulos (Ed.), *Economics of education: Research and studies* (pp. 315-323). Kidlington, Oxford: Pergamon Press.

Jackson, N. & Lund, H.S. (Eds) (2000). *Benchmarking for higher education.* Buckingham, England: Society for Research into Higher Education & Open University Press.

Kim, Y. H. (1999). Recently changes and developments in Korean school education. In Townsend, T., & Cheng, Y. C. (eds). *Educational change and development in the Asia-Pacific region: Challenges for the future.* (pp. 87-112). The Netherlands: Swets and Zeitlinger.

Leithwood, K.A., Aitken, R & Jantzi, D. (2001). *Making schools smarter: a system for monitoring school and district progress*. Thousand Oaks, California: Corwin Press.

MacBeath, J.E.C. (1999). *Schools must speak for themselves: the case for school self-evaluation*. London: Routledge.

MacBeath, J.E.C. (2000). *Self-evaluation in European schools: a story of change*. London: Routledge.

Mahony, P. & Hextall, I. (2000). *Reconstructing teaching: standards, performance and accountability*. London: Routledge.

Manz, C. C. (1986). Self-leadership: Toward an expanded self-influence processes in organizations. *Academy of Management Review*, *11*, 585–600.

Manz, C. C., & Sims, H. P. (1990). *Super leadership*. New York: Berkley Book.

Maslow, A. H. (1970). *Motivation and personality* (2nd ed.). New York: Harper & Row.

Medley, D. M. (1982). Teacher effectiveness. In H. E. Mitzel et al. (Eds.), *Encyclopedia of educational research* (5th ed., pp. 1894-1903). New York: Free Press.

McMahon, W. W. (1987). Consumption and other benefits of education. In G. Psacharopoulos (Ed.), *Economics of education: Research and studies* (pp. 129-133). Kidlington, Oxford: Pergamon Press.

Morgan, C. & Morris, G. (1999). *Good teaching and learning: pupils and teachers speak.* Buckingham, England: Open University Press.

Murgatroyd, S., & Morgan, C. (1993). *Total quality management and the school.* Buckingham, UK: Open University Press.

Naisbitt, J., & Aburdence, P. (1991). *Megatrends 2000.* New York: Avon.

Schmuck, R.A., & Runkel, P.J. (1985). The handbook of organization development in schools (3rd edition). Prospect Hights, IL: Waveland Press Inc.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization.* NY: Doubleday.

Smith, H., Armstrong, M. & Brown, S. (Eds). (1999). *Benchmarking and threshold standards in higher education.* London: Kogan Page.

Stromquist, N.P. & Monkman, K. (2000). *Globalization and education: integration and contestation across cultures.* Lanham, Md. Rowman & Littlefield.

Sunstein, B.S. & Lovell, J.H. (Eds). (2000). *The portfolio standard: how students can show us what they know and are able to do.* Portsmouth, NH: Heinemann.

Tam, W.M., Cheng, Y.C. & Cheung, W.M. (1997). A Reengineering Framework for Total Home-School Partnership. *International Journal of Educational Management.* 11(6), 274-285. (UK)

Tenner, A. R., & Detoro, I. J. (1992). *Total quality management.* Reading, MA: Addison-Wesley.