



Review of New Model of Quality Improvement in Educational Systems

Saba Rasouli*, Maryam Asadollahi

Department of education, Islamic Azad University Khorasgan Branch, Iran

Received: 02 April 2020

Accepted: 12 May 2020

Published: 01 June 2020

Abstract

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. According to Cheng, the world-wide education reforms are experiencing three waves since the 1970s. The three waves of reforms are mainly based on different changes and theories of education effectiveness, and they result in the employment of different strategies and approaches to changing schools and education. This paper aims to review the characteristics and changes 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 changes of education.

Keyword: Quality; Education; Quality Assurance; Effectiveness

How to cite the article:

S. Rasouli, M. Asadollahi, Review of New Model of Quality Improvement in Educational Systems, *J. Hum. Ins.* 2020; 4(2): 57-66, DOI: 10.22034/JHI.2020.109835.

©2020 The Authors. This is an open access article under the CC BY license

1. Introduction

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 [1].

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. 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. 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 [1-3].

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.

* Corresponding Author Email: s.rasouli.m1986@gmail.com

Particularly when knowledge driven economy and information technology are strongly emphasized in the new millennium, people urge changes model 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. 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 change 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 [1, 3, 4].

The above three waves of education reforms provide a general typology to capture and understand the key changes 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 change of learning in the new millennium.

These three waves represent changes in changes 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 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 [5-7].

This paper aims to review the characteristics and changes 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 changes 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 change for quality assurance in education.

2. First Wave: Internal Quality Assurance

2.1. 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. This type of quality assurance may be named as "**Internal Quality Assurance**" [8, 9].

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:

- 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 [10, 11].

2.2. 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.

2.3. 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 [12, 13].

Currently, based on this approach, there is a strong emphasis on using the benchmarking concept 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.

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 [2, 14, 15].

2.4. 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. 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.

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. 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.

2.5. Models of Internal Quality Assurance

According to Cheng (1996) 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. 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, decisionmaking), 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 functions 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. 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.

3. 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. Some focused-on improvement of school management and classroom environment; some on curriculum development and change; some on teacher qualifications and competencies; some on improvement of teaching and learning processes; and some on evaluation and assessment. 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, policymakers, 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.

3.1. 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. 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.

3.2. Models of Interface Quality Assurance

As discussed previously, there are eight models of quality assurance in education. 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 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.

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. 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. 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. 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. 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. 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.

3.3. Relationship between Internal and Interface Quality Assurance

Each of the above eight models of internal and interface quality assurance have 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.

4. Third Wave: Future Quality Assurance

4.1. Towards the Third Wave

In the past decade, there have been numerous education reforms and initiatives following the change 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.

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.

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 novels 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 change model 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 quality for the future. 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 change model in Education" in the new century.

4.2. 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. 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.

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 [16-18].

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. Due to the growing global consciousness, 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.

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 [19-21].

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 lifelong learning to the future development reinforces the relevance to education functions as necessary component in quality assurance[5, 22-24].

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.

5. Conclusions

From the above discussion, we can see that the three waves of education reforms in fact represent different changes in conceptualization and assurance of education effectiveness and quality.

5.1. Three changes of Quality Assurance

The first wave of education reforms emphasizes internal improvement and effectiveness. Therefore, the change 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 change model 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 change model in education should including emphasis on the development of students' contextualized multiple intelligences and triplication 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, triplication 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.

References

1. Economy DR, Sharp JL, Martin JP, Kennedy MS. 2014. Factors associated with student decision-making for participation in the Research Experiences for Undergraduates program. *International Journal of Engineering Education* 30(6): 1395-1404.
2. Education NA, Program P, on the Diagnosis TEP, of Asthma M. Section 5, Managing Exacerbations of Asthma. Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma: National Heart, Lung, and Blood Institute (US); 2007.
3. Economy D, Martin J, Kennedy MS, editors. Factors influencing participants' selection of individual REU sites. 2013 IEEE Frontiers in Education Conference (FIE); 2013: IEEE.
4. Mamaril N, Usher E, Economy D, Kennedy MS, editors. An examination of students' motivation in engineering service courses. 2013 IEEE Frontiers in Education Conference (FIE); 2013: IEEE.
5. Economy P. *De kleine managen voor Dummies/druk 1*: Pearson Education; 2012.
6. Egan D, Marshall S. 2007. Educational leadership and school renewal in Wales. *Australian journal of education* 51(3): 286-298.
7. Marshall S. 2007. Educational leadership and school renewal in Wales David Egan. *Australian Journal of Education* 51(3): 286-298.
8. Nelson B, Economy P. *Managen voor Dummies [pocketeditie]*: Pearson Education; 2003.
9. Mamaril NA, Usher EL, Li CR, Economy DR, Kennedy MS. 2016. Measuring undergraduate students' engineering self-efficacy: A validation study. *Journal of Engineering Education* 105(2): 366-395.
10. Ellis R, Sheen Y, Murakami M, Takashima H. 2008. The effects of focused and unfocused written corrective feedback in an English as a foreign language context. *System* 36(3): 353-371.
11. Ferris DR. 2010. SECOND LANGUAGE WRITING RESEARCH AND WRITTEN CORRECTIVE FEEDBACK IN SLA: Intersections and Practical Applications. *Studies in Second Language Acquisition* 32(2): 181-201. Epub 2010/04/23.
12. Englin J, Mendelsohn R. 1991. A hedonic travel cost analysis for valuation of multiple components of site quality: The recreation value of forest management. *Journal of Environmental Economics and Management* 21(3): 275-290.
13. Nelson B, Economy P. *La biblia del management: Grupo Planeta (GBS)*; 2006.
14. Education NA, Program P, on the Diagnosis TEP, of Asthma M. Section 3, Component 1: Measures of Asthma Assessment and Monitoring. Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma: National Heart, Lung, and Blood Institute (US); 2007.
15. Rubenstein-Montano B, Liebowitz J, Buchwalter J, McCaw D, Newman B, Rebeck K. 2001. A systems thinking framework for knowledge management. *Decision Support Systems* 31(1): 5-16.
16. Kawano SM, Economy DR, Kennedy MS, Dean D, Blob RW. 2015. Comparative limb bone loading in the humerus and femur of the tiger salamander *Ambystoma tigrinum*: testing the 'mixed-chain' hypothesis for skeletal safety factors. *Journal of Experimental Biology*: jeb. 125799.
17. Watch E. *Econ Stats: The Economic Statistics and Indicators Database*. 2015.
18. Bishop R, Economy NC. 2015. Raising energy efficiency standards to the global best. *New Climate Economy*.
19. Economy NC. 2018. Unlocking the inclusive growth story of the 21st century: Accelerating climate action in urgent times. *Retrieved on 3*: 18.
20. Schultz BM, Li N, Economy DR, Sharp JL, Mara NA, Kennedy MS. 2018. Tribological performance of monolithic copper thin films during nanowear. *Wear* 394: 50-59.
21. Nelson B, Economy P. *Management für Dummies*: John Wiley & Sons; 2017.
22. Korten S, Christian K. Application of RFID (Radio Frequency Identification) in the Timber Supply Chain Einsatz von RFID in der Holzerntekette 2008. 551-569 p.
23. Cyert RM, Kang S-H, Kumar P. 2002. Corporate Governance, Takeovers, and Top-Management Compensation: Theory and Evidence. *Management Science* 48(4): 453-469.
24. Watch E. *Economic statistics and indicators*. 2010.