EXPLORING TQM—INNOVATION RELATIONSHIP: LITERATURE REVIEW AND SYSTEM ARCHITECTURE

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Abstract

Facing rapid changes in Taiwan’s educational environment, especially the homogeneity of competition, uncertain education policies, continuing decline in birth rate and limited resources of funds, continuing education (CE) institutes thus are forced to make an attempt to retarget their market and customers. Conventionally, TQM is well-known approach for organizational innovation. However, existing research on TQM-innovation largely focuses on investigating TQM’s impacts on innovation and exploring the determinant factors of TQM that influence innovation. To clearly depict the relationship, authors develop a system architecture named ESC and propose seven propositions facilitate the understanding of the organizational innovation and quality system in a CE institute.

Keywords: TQM; Innovation; Continuing education; Strategic management; Case study

TQM 與創新關聯之探究—文獻回顧與系統架構

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摘要

在現今多變的教育環境中，特別在同質性競爭、教育政策未明、持續探底的生育率及有限的資金來源下，使得推廣教育機構必須重新鎖定他們的市場與顧客。傳統上，TQM 是較为人知的創新方法。然而，現有 TQM 與創新的文獻大多偏向驗證 TQM 之於創新的影響或是 TQM 構面之於創新的探討。為清楚說明兩者間的關係，本文擬提出 ESC 系統建築並提出七個命題以期提供外界對於推廣教育的組織創新與品質系統能多一份瞭解。

關鍵字：TQM, 創新, 推廣教育, 策略管理, 個案研究
Introduction

At present, higher education worldwide is undergoing a noticeable change from elite to a mass system (Weeks, 2000) where competition is tough and its products are becoming increasingly vast and diverse. It is further argued that institutions of higher education currently face an extraordinary array of demographic, economic, political and cultural pressure (Kunstler, 2005). For these reasons, institutions of higher education, charities, public sectors and other non-profit organizations are preparing themselves to be more market oriented. Since 1998, the Ministry of Education (MOE) in Taiwan has been actively promoting “Recurrent Education” and “Life-long Education”. The number of continuing education (CE) institutes thus has been on the rise around the island. However, facing rapid changes in Taiwan’s educational environment, especially the homogeneity of competition, uncertain education policies, the continuing decline in birth rate annually and the limited resources of funds for each university from the government, CE institutes are forced to make an attempt to retarget their market and customers. Accordingly, they have to find other ways to raise money by themselves and act in a more market-driven and learning-oriented manner to increase their market share. Owing to its active role of the higher education, this paper will focus on universities and colleges for the further discussions in following sections.

Conventionally, TQM and BPR each are approaches for process improvement and organizational innovation whereas there still is a debate concerned with its complement and substitute. The past literature related to TQM-innovation relationship largely focused on the manufacturing (Demirbag et al., 2006; Yang, 2006) and the services (Samat et al., 2006) instead of the education. Besides, most of them involved in investigating TQM-innovation relationship concerning that of examining the determinant factors of TQM which influence innovation (Rahman & Bullock, 2005; Bayazit & Karpak, 2007), analyzing its role of TQM in the process of innovation (Martinez-Lorente et al., 1999; Santos-Vijande & Alvarez-Gonzalez, 2007), investigating the relationship among TQM, innovation and performance (Prajogo & Sohal, 2001, 2006a, 2006b; Singh & Smith, 2004; Perdomo-Ortiz et al., 2006), determining the impact of TQM, market orientation (MO) on performance (Demirbag et al., 2006). Meanwhile, recent studies that have investigated the TQM-innovation relationship have come to a disagreement with each other (i.e. against or support the relationships between TQM and innovation). Over the last two decades, TQM has emerged as one of the most popular and durable modern management concepts, and despite its numerous critics, TQM has a profound and unparalleled impact on modern business history (Ghobadian & Gallear, 2001; Chiles & Choi, 2000).

As Bolwijn and Kumpe (1990) argued, the competitive environment today requires organization to pursue more complex dimensions of performance, most notably quality and
innovation. The CE institute’s objective is not only to beat the competition but also to grow the profit and wealth; therefore CE institutes should redesign their business process (Davenport & Stoddard, 1994; Hammer & Champy, 1993) for greater flexibility and innovation. From an innovation point of view, the examination of the impact of TQM on innovation performance is important in contributing to the development of managerial practices, which can be used as a resource for determining innovation performance (Prajogo & Sohal, 2006b). Hence, if these institutions want to succeed in the ever-changing marketplace, they have to learn to satisfy various levels of customer’s needs and to design a CE system that embraces innovation to enhance the operating efficiency and sustained competitive advantage. From strategic management perspective, if a CE institute wants to outpace its competitors in order to maintain its sustained competitive advantage, it has to be equipped with market-oriented, quality-focused, innovative culture, learning capacity etc.

This study makes a number of contributions to the extant literature. First, it focuses on CE industry and this emerging market in this field will help us broaden and refresh our view. Second, the authors regard TQM and BPR as cousin than twins where CE institutes would rather adopt continuous improvement approach (e.g., TQM) than radical one (e.g., BPR) under increasingly homogeneous competition for its less risky for an organization to innovate. Third, all related to TQM-innovation are often subject to omitted effects of environmental context and probably bring to a biased conclusion. To clearly depict the TQM-innovation relationship under the strategic direction, the authors therefore develop a system architecture named ESC (Environment-Strategy-Culture), where proposes seven propositions for further empirical testing. Fourth, it suggests that the final decision in adopting TQM or BPR depends on environmental needs, including the external and the internal respectively. The former, for example, is opportunities or threats, and the latter is organizational capabilities and culture. Finally, the authors introduce two business models as a benchmark to facilitate understanding of the organizational innovation and quality system in a CE institute.

The reminder of this paper is structured as follows— In section 2, we will first review related literature between CE and TQM to help us to reach a common definition of the main concepts, and then, we will make a comparison between BPR and TQM. Next, in section 3, we will investigate the conflicting arguments on TQM-innovation, develop a system architecture named ESC to facilitate understanding the role of TQM, establish a research framework and offer seven propositions for further empirical testing. In section 4, we will present a conceptual model as a benchmark for researchers and practitioners. Finally, the overall conclusion will be given in section 6.
Literature review

Continuing education (CE)

Definition of CE

Ramaiah and Moorthy (2002) defined continuing education (CE) as the provision of opportunities for people to continue their learning. If CE is to facilitate the development of a learning society, then the society must provide a rich educational environment with a wide range of diverse resources and opportunities for learning not only through formal systems but also through informal systems. Alemna (2001) mentioned that CE as a truly continuing process should be founded on previously acquired professional knowledge, skills and attitudes; along with individuals’ experience in the workplace. Owing to the rapid changes of environment, people couldn’t prevent themselves from facing the challenges of knowledge. Therefore, they need to pick up their professional skills through CE system, which can provide appropriate opportunities for those who cannot finish their professional or normal education.

Management of CE organization

Petridou and Chatzipanagiotou (2004) noted that each organizations of CE can be regarded as a self-contained unit within a country’s wider system of CE (Figure 1), and this unit continuously interacts with the other systems and hypersystems in its external environment. “Change” is the nature of CE market. While change brings uncertainty and risk, it also creates potential opportunity indeed. Companies cannot protect themselves from change. Accompanied by the rising competition of homogeneity, organization should effectively manage its external/internal operation system through constantly re-engineering and innovation.
TQM

Most enterprises in manufacturing and services have devoted considerable attention to the implementation of TQM. Since the 1980s, TQM has become a globally implemented management technique (Trappey, 1995). It is broadly agreed that TQM is an integrated management philosophy aimed at continuously improving the performance of products, processes, and service to achieve and surpass customer expectation (Bayazit & Karpak, 2007). The incentives are that TQM generates improved quality of products and services, raises production performance, and reduces costs, thus improving business competitiveness (Rajagopal et al., 1995; Youssef et al., 1996). Easton and Jarrell (1998) claim that organizations that implement TQM well generate many benefits including higher quality products, reduced costs, more satisfied customers and employees, and improved financial performance. Short and Rahim (1995) and Boon et al. (2005) view TQM as a program or a system, but as a set of philosophies and methods used by an organization to guide it in continual improvement in all aspects of its business. Kanji (2002) defines TQM as a management philosophy that fosters an organizational culture committed to customer satisfaction through continuous improvement.

TQM seeks to create an atmosphere in which “doing it right the first time” becomes the
goal, where quality is designed and built into each activity rather than be inspected –in after the fact. The focus is the changes in organizational culture to drive the entire effort to reduce the cost of quality (Sia et al., 1997; Braithwaite, 1994). TQM is an approach which involving a series of planning, organizing and understanding each activity to improve the competitiveness, effectiveness and flexibility of a whole organizations. This study here is to review and to summarize relative papers focused on dimensions of TQM (see Table 1). Accordingly, we conclude with that TQM firstly is a multi-dimensional management philosophy. Next, the elements of TQM can be generally included with top management support, inter/external customer satisfaction (e.g. customers, suppliers and employees), process design and human resource management (i.e. organizational culture/climate). Finally, roughly categorized into two aspects including soft TQM and hard TQM. The former is HRM focused and the latter is process oriented.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saraph et al. (1989)</td>
<td>Top management leadership; Role of the quality department; Training; Product design; Supplier quality management; Process management; Quality data reporting; Employ relations.</td>
</tr>
<tr>
<td>Powell (1995)</td>
<td>Committed leadership; Adoption and communication of TQM; Closer customer relationships; Closer supplier relationships; Benchmarking; Increased training; Open organization; Employee empowerment; Zero-defects mentality; Flexible manufacturing; Process improvement; Measurement</td>
</tr>
<tr>
<td>Flynn et al. (1995)</td>
<td>Top management support; Customer relationship; Supplier relationship; Workforce management; Employee attitudes; Product design; Process flow management; Statistical process control/feedback.</td>
</tr>
<tr>
<td>Martínez Lorente et al. (1999)</td>
<td>Top management support; Customer relationship; Supplier relationship; Workforce management; Employee attitudes and behavior; Product design process; Process flow management; Quality data and reporting; Role of quality department; Benchmarking</td>
</tr>
<tr>
<td>Brah et al. (2000)</td>
<td>Top management support; Customer focus; Employ involvement; Employee training; Employ empowerment; Supplier quality management; Process improvement; Service design; Quality improvement rewards; Benchmarking; Cleanliness and organization.</td>
</tr>
<tr>
<td>Antony et al. (2002)</td>
<td>Management commitment; Role and quality department; Training and education; Employee involvement; Continuous improvement; Supplier partnership; Product/service design; Quality policies; Quality data reporting; Communication to improve quality; Customer satisfaction orientation.</td>
</tr>
</tbody>
</table>
Singh and Smith (2004) | Top management leadership; Customer focus; Employee relations; Relationship with supplier; Competitors; Communication/Information systems; Product/process management.

Rahman and Bullock (2005) | Soft TQM; Hard TQM

Demirbag et al. (2006) | Quality data & reporting; Role of top management; Employee relations; Supplier quality management; Training; Quality policy; Process management

Perdomo-Ortiz et al. (2006) | Management support; Information for quality; Process management; Product design; Human resource management; Relation with customers and suppliers

Prajogo and Sohal (2006b) | Leadership; Strategic planning; Customer focus; Information and analysis; People management; Process management

Sila (2007) | Leadership; Strategic planning; Customer focus; Information and analysis; Human resource management; Process management

Abrunhosa and Sa (2007) | Autonomy; Communication; Consultation; Flexibility; Supportive people management practices

Source: author

**How to distinguish from TQM and BPR?**

Although BPR shares some features with TQM, such as the recognition of the importance of processes, concern about the needs of the customer, eliminating waste and benchmarking, however, there are two significant differences. For example, reengineering seeks breakthroughs, not by enhancing existing processes, but by discarding them and replacing them with entirely new ones (Martinez-Lorente et al., 1999). Davenport (1993), Harrison and Pratt (1992) suggest that TQM and BPR can and should form an integrated strategic management system within organizations. MacDonald and Dale (1999) analyzing the difference between TQM and reengineering draw the following conclusions:

- Large step changes are riskier, more complex and more expensive than continuous improvement;
- Reengineering places more emphasis on equipment and technology and TQM more emphasis on people;
- Reengineering tends to concentrate on one process at a time using a project planning methodology, whereas TQM takes a more holistic view of the organization, building improvement into all its areas of operation.

Based on definitions mentioned above, this paper is to briefly list the differences between BPR and TQM as bellows (Table 2):
EXPLORING TQM—INNOVATION RELATIONSHIP:
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Table 2. BPR vs. TQM

<table>
<thead>
<tr>
<th></th>
<th>Radical improvement (BPR)</th>
<th>Continuous improvement (TQM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>Abrupt, volatile</td>
<td>Gradual, constant</td>
</tr>
<tr>
<td>Type</td>
<td>Cultural/Structural</td>
<td>Cultural</td>
</tr>
<tr>
<td>Effects</td>
<td>Immediate, dramatic</td>
<td>More subtle</td>
</tr>
<tr>
<td>Involvement</td>
<td>A few champions</td>
<td>From few to everybody</td>
</tr>
<tr>
<td>Investment</td>
<td>High initially, less later</td>
<td>Low initially, high to sustain</td>
</tr>
<tr>
<td>Period</td>
<td>Longer</td>
<td>Shorter</td>
</tr>
<tr>
<td>Range</td>
<td>Wider, cross department</td>
<td>Narrower, within department</td>
</tr>
<tr>
<td>Orientation</td>
<td>Technology and people</td>
<td>People</td>
</tr>
<tr>
<td>Focus</td>
<td>Processes and profits</td>
<td>Processes</td>
</tr>
<tr>
<td>Implementation</td>
<td>Statistical control</td>
<td>Information technology</td>
</tr>
<tr>
<td>Risk</td>
<td>High</td>
<td>Adequate</td>
</tr>
</tbody>
</table>

Source: Devenport (1993); Zhang, Q. and Cao, M. (2002)

TQM and BPR: complement or substitute?

According to Love and Gunasekaran (1997) and De Bruyn and Gelders (1997), TQM is an enabler of reengineering. However, other authors argue that BPR is a successor to TQM (Born, 1994) and the continuous improvement (i.e. TQM) is less risky than BPR in the organizational change (Leach, 1996). Cole (1994) concludes that an extraordinary amount of overlap exists between the quality and reengineering movements, and that the two initiatives complement each other. Some authors consider that reengineering and TQM are compatible (Harrington, 1995; Kelada, 1994; Grover & Malhotra, 1997; MacDonald & Dale, 1999). Other authors argue that BPR and TQM approaches share certain principles and adopt a process perspective, so it is possible to make some general propositions on managing change that will enable a company to reinvent its competitive advantage (Jaworski & Kohli, 1993). Several authors of papers on BPR appear to consider continuous improvement of processes to be the only link to TQM. However, other aspects of the management of processes are considered equally important in both TQM and BPR (O’Neill & Sohal, 1999), including:

- **Benchmarking** (D’Aveni, 1994; Harrison and Pratt, 1992);
- **Culture change** (Barrett, 1994; Bartlett & Ghosal, 1995; Ghosal & Bartlett, 1996) and
- **Performance measurement** (Hagel, 1993; Guha et al., 1993).

Finally, this section will come to a conclusion as follows:
Both TQM and BPR are quality-oriented approaches for organizational improvement.

The final decision of adopting TQM or BPR relies on the real situations and problems that the organization encounters with.

The successful implementation of TQM and BPR largely depends on employees’ involvement and top management supports.

According to Kelada’s (1994), reengineering can bring innovation, but must be underpinned by the objectives of TQ if success is to be assured. Thus, this paper strongly supports the issue that BPR is complementary to TQM.

According to its definition and application respectively, we regard TQM and BPR as a cousin rather than a twins.

Organizational Innovation

Innovation has been a topic for discussion and debate for hundreds of years (Trott, 1998). The innovation can be a product or a service, an organizational process or an administrative program, a technology, or a policy or a system related to organizational members (Damanpour & Evan, 1984). Schumpeter (1934) firstly offered the concept of innovation and focused on the importance of new products as stimuli to economic growth. He argued that an innovation is any change in inputs, methods, or outputs which improves the commercial position of a firm and that is new to the firm’s operating market. Thompson (1965) defined innovation as “the generation, acceptance and implementation of new ideas, processes, products or services”. In addition, innovation has been defined as “the adoption of ideas or behaviors that are new to the adopting organization (Daft, 1982; Downs & Mohr, 1976; Rogers, 1983; Zaltman et al., 1973). In business world, the capability to innovate is a key source of competitive advantage, and is also the key to maintain a competitive advantage (Tidd et al., 2001; Afuah, 2003). The idea that innovation is a competitive instrument essential for firms’ long-term success and survival is widely recognized (Deshpande et al., 1993).

Conflict arguments between TQM and Innovation

In today’s business environment, there is no executive task more vital and demanding than the sustained management of innovation and change (Tushman & Nadler, 1986). Innovation is widely acknowledges as key to economic development, since it potentially leads to productivity and competitive gains (Abrunhosa & Sa, 2007). TQM has demonstrated its potential to be a successful way for organizations to eliminate costs, improve productivity and gain a competitive edge in the market place (Martinez-Lorente et al., 1999). Therefore, some advocates of TQM have suggested that it provides the necessary platform for inculcating innovation in organizations (Singh & Smith, 2004). However, the TQM-innovation relationship appears to have conflicting arguments over time. To clearly depict the relationship between TQM and
innovation, the authors thus review academic papers and summarize these findings based on principles of TQM (i.e., customer focus/market orientation, continuous improvement and people involvement/teamwork).

(1). Customer focus/market orientation

Shapiro (1988) suggests that market orientation be treated as synonymous to customer orientation. Market orientation allows a strategic alignment between the market and the technological state of the firms. Thus, TQM practices associated with customer orientation promote learning and innovation processes by dynamizing sources of innovative ideas from the market (Perdomo-Ortiz et al., 2006). Reed et al. (2000) concluded that TQM has the potential to generate competitive advantage. They claimed that generating competitive advantage depends on not only on TQM but also on the fit between the strategy, firm orientation, and the environment. However, the role of customer focus in driving innovation still has debates.

(1-1). Support the positive relationship between TQM and innovation

- Customer focuses help organizations to search and develop the new products and services to meet the changing needs and to ensure that innovation creates customer value (Juran, 1988; Wycoff, 2003).
- Customer focus will provide a clear focus for innovation by linking innovation with customers’ needs (Prajogo & Sohal, 2001).

(1-2). Support the negative relationship between TQM and innovation

- Customer focus could lead organizations to be reactive and short term in focus in terms of serving the current and stated needs of customers (Prajogo & Sohal, 2001).
- Customer focus would make organizations listen their customers too carefully that push them to lose their position as industry leaders (Christensen & Bower, 1996);
- Customer focus is likely to inhibit significant innovation, since the process is constrained by what the customers want, thus making the organization too reactive (Slater & Narver, 1998);
- Customer focus could enforce the maintenance of long-term relationship with existing customer and this could constrain a firm’s innovation capability (Wind & Mahajan, 1997);
- Customer focus will result in product conformance rather than product innovation (Atuahene-Gima, 1996);
(2). People involvement/teamwork

TQM stresses the importance of involving everyone in the process of “customer driven” continuous improvement, which can only happen if all staff is given the space and responsibility to innovate and make decisions. This generally implies a new job design, which encompasses more autonomy and flexibility in performing daily activities (Abrunhosa & Sa, 2007)

(2-1). Support the positive relationship between TQM and innovation

- Empowerment, involvement and teamwork are substantial in determining the success of organizational innovation (Prajogo & Sohal, 2001);
- Team cooperation, communication and conflict resolution are also critical dimensions in teams with an innovation expectation (Beer & Eisenstat, 2000; McDonough, 2000);
- Cross-functional teamwork is one of the most effective channels of communication, which is recognized as the primary determinant in organizational innovation (Prajogo & Sohal, 2001)

(2-2). Support the negative relationship between TQM and innovation

- In general, there is no time for employees to take part in the non-production activities, so that it also reduces their chances to participate in the process of innovation (Ahanotu, 1998).
- TQM cultural tendency toward group working will constrain individual creativity, resulting detrimental effect on radical innovations and invention (Prajogo & Sohal, 2001).

(3). Continuous improvement

Continuous improvement requires an organizational culture that constantly encourages members to innovate minimizes fear and provides them with a rich and diverse set of tools (Abrunhosa & Sa, 2007). Several studies have been analyzing at what extent organizations that implement TQM principles and approaches tend to be more innovative (Prajogo & Sohal, 2001; Singh & Smith, 2004; Molina et al., 2007; Sa & Abrunhosa, 2007). In general, innovation clearly depends on numerous factors and the contribution of TQM is better acknowledged when a single industry is considered (Abrunhosa & Sa, 2007). It means that the need for business innovation is one of the reasons why companies have embraced TQM. However, TQM is not the appropriate management approach to develop and apply business innovation (Martinez-Lorente et al., 1999).

(3-1). Support the positive relationship between TQM and innovation

- Continuous improvement encourage change and creative thinking in how work is organized and conducted (Prajogo and Sohal, 2001)

(3-2). Support the negative relationship between TQM and innovation
The stress on incremental improvement could lead people to work on unambitious goals and derive solutions that are not novel (Harari, 1993);
Continuous improvement requires standardization (Imai, 1986), which may hinder the innovation;
Standardization could inhibit innovation because it reduces the ambiguity of any task that is necessary to enforce innovation (Prajogo & Sohal, 2001);
Standardizations will raise the fear of breaking rules because of possible punishment for doing so (Morgan, 1993);
Too much formalization is referred to the rigidity or stickiness on existing methods, which will hinder creativity.
TQM will constrain employees’ learning within a pre-designed regime and this will bring employees to focus on the details of the quality process instead of new ideas (Ahanotu, 1998).

Based on literature above, as we know, TQM is a complex management philosophy. Because it encompasses “hard” and “soft” elements, which can be associated with somehow contrasted views of the organization (mechanistic versus organic), the overall impact of TQM on innovation is difficult to generalize (Abrunhosa & Sa, 2007). Accordingly, this section argues that the TQM-innovation relationship should depend on the types of organization. In other words, if TQM approach is implemented in an organic-structure organization instead of a mechanic one, it appears to have a significantly positive TQM-innovation relationship.

**System architecture, research framework and Propositions**

Although this paper has finished exploring those conflicting arguments concerning the TQM-innovation relationship earlier, Prajogo and Sohal (2001) argue that the focus should be more emphasized on studying the multidimensionality of TQM rather than investigating whether TQM is positively related with innovation. They further propose that there are three factors (i.e., external environment, organization’s strategy and organizational culture) affects the multidimensionality of TQM. This notion not only outlines the interactions among environment, strategy and culture, but also identifies their causal relationships. From strategic views, innovation has widely been seen as an organization’s requisite capability, which would eventually lead an organization to adapt and survive. TQM, a management philosophy and an improvement approach, has a mediating effect on innovation performance whereas organizational culture plays a catalyst. However, the final adoption of TQM (or BPR) and the feasible culture should be in accordance with organization’s strategies in order to meet the market’s (e.g., customers and suppliers) needs. This paper thus makes an attempt to link the concepts of strategic management to Prajogo & Sohal’s and to put these two into shape.

**System architecture (ESC)**

No doubt that the impacts of the environment on organizations have been significant and
the challenges force organizations inevitably to deal with. Sitkin et al. (1994) suggest that
organizations will be driven towards innovation (referred to as learning-oriented) when they
perceive a certain degree of uncertainty in their environment. This study develops the system
architecture named “ESC” (Figure 2) for CE institutes and establishes a research framework for
another seven propositions. The term “ESC”, just like the bottom right up on your keyboard, is
referred to “Escape” which means the adoption of this system can help an organization escape
from the old and inefficient situation and move towards another new and innovative situation. In
other words, the ESC is a mobile passport for an organization to move towards success. Its
functional definition will be discussed respectively as follows:

**Environment (E)**

Facing the increasingly fierce competitions, CE institutes must carefully monitor all the
environments surrounding them in order to discover the potential opportunities and threats.
Santos-Vijande et al’s (2005) argue that market orientation promotes two dimensions of the
firms’ strategic behavior strongly linked to the innovative behavior: aggressiveness and
proactiveness. The former entails an immediate resources allocation when new market
opportunities are detected to capture the advantages associated with being the first to market.
The latter shows the firm’s interests in continuously searching for the new market opportunities
and experimenting with response to changing market condition.

**Strategy (S)- in terms of customer focus/market orientation**

An organizational change toward being more marketed requires a steadfast top
management commitment and a bottom up change, which could be facilitated by an effective
implementation of TQM practices. Such a change program needs to be fostered by
cross-functional activities, shared objectives and a decentralized structure, which may increase
the firm’s capabilities to respond to their customers (Day, 1994). Many research strongly argue
that TQM is a transcend strategy and encompasses more than one of the generic strategies in
Porter’s (1980) model, such as cost leadership & differentiation (Belohlav, 1993; Reed et al.,
1996). After realizing the real situations and problems they have faced, CE institutes have to
develop various strategies to adapt to the changing environment (e.g. customers needs,
competitors actions, suppliers’ relations and employees’ involvement etc.). As we know, the
relationship between an organization’s environment and its strategy has been formulated and
examined in the strategic management field (Prajogo & Sohal, 2001).

**Organizational culture (C)**

Organizational culture is always regarded as a catalyst in postulating the innovation
performance. Literature on organizational innovation not only emphasizes the importance of
culture as a major determinant in innovation performance (for example, Robertson & Wnd,
1980; Kanter, 1983; Branen, 1991; Feldman, 1988), but also is an important part of TQM with
its soft aspect (van Donk & Sanders, 1993; Westbrook & Utley, 1995; McNabb & Sepic, 1995).
As many scholars suggest that many practices in innovation are similar to those of TQM practices (Schroeder et al., 1989; Vrakking, 1990; Galbraith 1982; Chiesa et al., 1996; Tidd et al., 1997; Ahmed, 1998; Tang, 1998). Scholars further argued that organizational culture and HRM are not separable in an organization (Jackson & Schuler, 1995). Powell (1995) argues that the soft and intangible elements of a culture are more powerful in determining organizational performance than the hard aspects.

According to the relative literature mentioned above, this paper is to establish a research framework (Figure 3) and then to offer seven propositions as follows:
Figure 3. Research framework
Table 3 Summary of conflicting arguments between TQM and innovation

<table>
<thead>
<tr>
<th>TQM element</th>
<th>Positive arguments</th>
<th>Negative arguments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer focus</td>
<td>Customer focus will help organizations more aggressive to innovate in developing new products and services to meet the changing needs and to ensure that innovation creates customer value.</td>
<td>Customer focus could lead organizations to be reactive and prevent them from exploring un_served needs. Customer focus could make organizations listen their customers too carefully that push them to lose their innovation capacity. Customer focus is may inhibit organizational innovation, since the process is constrained by what the customers want, thus making the organization too reactive. Customer focus does not prepare the organization for turbulence or discontinuities in the market.</td>
</tr>
<tr>
<td>People involvement and teamwork</td>
<td>Empowerment, involvement and teamwork make employees feel that they have certain degree of autonomy, participation and flexibility in decision-making process. Team cooperation, communication and conflict resolution are critical dimensions in teams with an innovation expectation. Cross-functional teamwork is one of the most effective channels of communication, which is recognized as the primary determinant in organizational innovation.</td>
<td>In general, there is no time for employees to take part in the non-production activities, so that it also reduces their chances to participate in the process of innovation. TQM cultural tendency toward group working will constrain individual creativity, resulting detrimental effect on radical innovations and invention. Because in practice workers commit themselves to the lower scales of the improvement.</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>Continuous improvement encourages change and creative thinking in how work is organized and conducted.</td>
<td>TQM could lead people to work on unambitious goals and standardization may hinder the innovation. TQM with much formalization is referred to the rigidity or stickiness on existing methods, which will hinder creativity. TQM will constrain employees’ learning within a pre-designed regime and this will bring employees to focus on the details of the quality process instead of new ideas. Because stable and repetitive systems are promoted.</td>
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Source: author (modified Prajogo and Sohal, 2001 and Perdomo-Ortiz et al., 2006)
There are many common aspects to TQM and innovation (Prajogo & Sohal, 2001). Some elements of TQM and innovation are similar. For example, continuous improvement is a key feature of both TQM and innovation. Also “open” culture is seen as an important aspect of TQM and innovation. These commonalities suggest that organizations that implement TQM well could also be more innovative than organizations that do not (Singh & Smith, 2004).

**Proposition 1:** When an organization adopts TQM approach, it will lead to innovation.

There is a paucity of empirical research examining the relationship between market orientation (MO) and TQM implementation (Demirbag *et al.*, 2006). Litton (2001) argues that those organizations that implement TQM in their strategy and corporate culture are by nature, market oriented organizations. Both TQM implementation and market orientation require an organizational structure to be designed around the flow of value-adding activities and should also empower employees to manage organizational change (Demirbag *et al.*, 2006). Sparks (1993) stated that TQM increases the organization’s responsiveness to customer needs which is part of market orientation, and finally will lead to a longer relationship between the organization and the customer. Hurley and Hult (1998) argue that market orientation (concept focused on the creation of added value for customers and which, as a result, prioritizes the organizations’ customer orientation), constitutes an antecedent of firms innovativeness or predisposition to accept new ideas, the dimension of organizational culture that influences positively the capacity to develop new products and services (Santos-Vijande & Alvarez-Gonzalez, 2007). Hence, Based on proposition 1 & 2, there comes the proposition 3: TQM plays a mediating role between TQM and innovation.

**Proposition 2:** If an organization’s strategy is market-oriented, it may have impacts on the implementation of TQM approach.

**Proposition 3:** The relationship between market orientation (MO) and innovation is mediated by TQM implementation.

It is evident to suggest that HR practices that are complementary to marketing objectives are instrumental to achieving superior organizational outcomes (Jaworski & Kohli, 1993). Ruekert (1992) established that there is a strong association between effective recruitment and selection practices and the level of market orientation within organization. Market orientation is one kind of organization culture that effectively promotes employee behaviors to create value for customers (Narver & Slater, 1990). A firm that is market oriented will make all efforts to satisfy customer needs through mobilizing appropriate behavior of employees and coordinating managerial functions. Therefore, market orientation leads a firm to seek strategy-compatible HRM practices to induce customer-oriented employee behaviors (Wei & Lau, 2005).
Proposition 4: If an organization’s strategy is market-focused, it may have impacts on the implementation of human resource practices (HRPs).

Several researchers have noted that HRM leads to firm sustainable competitive advantage and superior performance and HRM is an important means of gaining these competitive advantage (Schuler & MacMillan, 1984; Barney, 1991; Wright et al., 1994). Boaden (1997) views TQM as one element of cultural change, along with human business process reengineering. In practice, a firm's technological innovation mainly comes from internal innovation (Pavitt, 1990) and internal innovation mainly comes from the employee with capability. Thus, there is a close relationship between HRM, technological innovation and firm performance. In the long run, efficient HRM can advance a firm's technological innovation, improve the company's competitive advantage and increase the company's performance (Huselid, 1995).

Proposition 5: The innovation performance is likely affected by the human resource practices (HRPs).

Wilkinson (1992) asserts that TQM has both a “hard” side and “soft” side, and that the “soft” side emphasizes the management of human resources (Yang, 2006). Morrison and Rahim (1993) and Hoogervorst et al. (2005) argue that TQM hinges on the effective management of human resources. Given that market orientation is considered as aspect of organizational culture, it can be argued that strategic HRM mediate the relationship between market orientation and organizational performance (Mavondo et al., 2005). Based on proposition 4 & 5, there comes the proposition 6: HRPs plays a mediating role between TQM and innovation.

Proposition 6: The relationship between TQM and innovation is mediated by the human resource practices (HRPs).

Based on literature mentioned above, the soft TQM encompasses part of HRM factors such as training, empowerment, leadership and teamwork. Evan and Lindsay (1996) agree that a total quality system is comprised of two distinct systems: the management system and the technical system. The management system is concerned with issues of HRM. According to Yang’s (2006) research, the empirical results proved that HRM played a key role in the implementation process of TQM, and HRM and TQM combined to give total quality and organization performance. Hence, by integrating HRPs into the TQM-innovation, it is possible to propose the following.

Proposition 7: The TQM implementation is likely affected by the human resource practices (HRPs).
Conceptual model: Learning Organization Library

Learning will lead to organization’s ability to rightly act on stimuli which resulting from either internal or external to the organization (Bierly & Hämäläinen, 1995; Steensma, 1996; Bhatt & Zaveri, 2002). Huber (1991) assumes that an organization learns if any of its units acquire knowledge that it recognizes as potentially useful to the organization. Sadler-Smith et al. (2001) see organizational learning as the development or acquisition of new knowledge or skills in response to internal or external stimuli that leads to a more or less permanent change in collective behavior, enhancing organizational effectiveness. The contributions of RBV of the firm and the approach based on knowledge management suggest that competitive advantage arises as a result of the abilities and capabilities of the company (Lopez et al., 2006). Knowledge is a source of competitive advantage (Conner & Prahalad, 1996) and the development of an effective and efficient knowledge management system has been considered a means to this end (Nonaka, 1994). After realizing the impact of learning organization on market competition in the future, SCE develops a conceptual model named “Learning Organization Library (LOL)” (Figure 4) which is based on the concept of organizational learning to aid itself in organizational knowledge management internally. It is no doubt that learning may be the only competitive advantage available to the company of the future as environment change dramatically (Cosier, 1981). LOL is a database that collects and keeps all the useful knowledge for SCE’s needs. All members can retrieve the available knowledge from LOL by their own authority. No matter what level of individual or organizational learning is, SCE makes an attempt to establish an infrastructure comprising of the 5th Discipline (Senge, 1994), TQM process (e.g., ISO 9001) and KM activities (i.e., knowledge creation, knowledge storage, knowledge sharing and knowledge diffusion) to connect the LOL with each business operation system (BOSS) within SCE.

Conclusion

Facing a dynamic and complex environment in contrast to the traditional close system (i.e. colleges and universities), CE institutions have to radically reshape their business processes and work flows, such as information gathering, process design, cross-departmental communication, feedback systems and performance appraisal. This paper argues that a firm is better to be market-driven and learning-focused through the integration of TQM and BPR to develop an organizational climate to support its innovation. To some degree, the authors regard TQM and BPR as a cousin rather than twins. To clearly depict the TQM-innovation relationship under the strategic direction, the authors develop a system architecture named ESC (i.e., Environment-Strategy-Culture), where seven propositions are proposed for further empirical testing and a conceptual model is introduced as a benchmark to facilitate the understanding of
the organizational innovation and quality system in a CE institute.

Figure 4. The concept of “Learning organization library (LOL)”

References


