Meeting the Cultural and Service Needs of Arabic International Students by Using QFD

Ahmed Mansour Mohsin and Karen Trimmer

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Abstract

Quality has become an important factor in global competition for many reasons. Intensive global competition and the demand for better quality by customers has led organizations to realize the benefits of providing quality products and services in order to successfully compete and survive. Higher education institutions are one example of these organisations. Higher education institutions work in an intensive competitive environment worldwide driven by increasing demands for learning by local and international students. As a result, the managers of these sectors have realized that improving the quality of services is important for achieving customer satisfaction which can help survival in an internationally competitive market. To do this, it is necessary for organizations to know their

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customers and identify their requirements. To this end, many higher education institutions have adopted principles of total quality management (TQM) to improve their education quality which leads to better performance through involvement of every department to achieve excellence in business. This chapter considers the importance of measuring quality in order to assist universities to proactively manage the design and improvement of the social and academic experiences of postgraduate international students, and plan management decision-making processes to deliver high-quality services in a globalized business of provision of higher education. Higher education institutions must operate effectively and efficiently and be able to deliver quality programs, by seeking to better understand the needs of their customers to be competitive in this market space.

Keywords

Arabic international students · International students · Quality · Quality function deployment · Total quality management · House of quality · Customer satisfaction · Cultural needs · Service needs · Social and academic experiences

Introduction

Higher educational institutions are perceived to offer high education services quality. In particular, Australian universities are among those to which students flock, because they provide a high quality of education, and services that fulfil the needs and expectations of students as important customers by enabling them to achieve customer satisfaction. In this chapter, the major focus is related to Arabic international students who are undertaking study in Australia. Those students are shifting from a teacher-centred environment to learning independently and also experiencing a completely different culture and language in their daily living.

In Australian universities, there is a significant increase in the number of international students, especially those coming from Arab countries. According to records, the number of these students exceeds 14,000 Arabic international students enrolled in all Australian educational institutions. Improving the quality of their social and academic experiences while studying in Australia is crucial to maintain a steady flow of students in the future, as well as university reputations (Azmat et al. 2013). Social and academic experiences are important for the Arabic international students because they come from a different culture which creates a number of challenges, especially in postgraduate study. Understanding the requirements of social and academic issues for those students has a positive effect on their satisfaction which in turn has an effect on future potential students. However, limited attention has been given to using well-documented business measures such as quality function deployment (QFD) as tools in understanding the quality of social and academic experiences of students.

Currently, the international higher education market is increasingly competitive due to the reduction of government funding that requires higher education institutions to look for other sources of revenue. As a consequence, higher education

institutions are reinventing themselves in their efforts to be more internationally attractive to cater to the increasing demands arising from international enrolments (Azmat et al. 2013; Islam and Hasin 2014). Australia has played a vital role in the supply of quality education to international students and other educational industries related to them (Son and Park 2014). It has experienced a substantial increase in the number of Arabic international students enrolled in higher education (Terraschke and Wahid 2011). Australia is the third-largest commercial exporter of higher education services internationally after the United States (US) and the United Kingdom (UK), with one-tenth of the world's international education market and responsible for around $AUD 15 billion in revenue (Harmon 2015).

The internationalization of education is important in Australia and it is an integral aspect of the Australian economy (Australian Bureau of Statistics (ABS) 2011). Presently, there is increased competition around the world among universities to attract more international students, as they are full fee paying students and the revenue is used to support the quality of education provided (ABS 2011). This places an obligation on higher education institutions to identify and look at the requirements of international students to properly contextualize these expectations in relation to the services and support they are able to provide. International students, including Arabic international students, bring their own expectations about teaching and learning, which are culture-bound and different (Alhazmi and Nyland 2010). Heading to study overseas is not an easy task. There are language differences, dietary differences, normative and sector systemic differences that at times place international students in conflict with university requirements, codes of conduct, learning and teaching practices, and general expectations. As in USA (Heyn 2013), studies of international students in Australia have focused mostly on students from Asia (Al-Mansouri 2014). Overall, few studies can be found in the literature that address specific issues of culturally different subgroups of international students such as Arabic international students (Heyn 2013; Shaw 2009). None of these have used QFD to improve the social and academic experiences of international students in Australia. As Heyn (2013) suggests, most of the research is centred on mental health and psychological concerns with acculturation.

Arabic international students face similar challenges to other international students (Terkla et al. 2005); however, there are particular differences that require specific attention. These include the difference in educational systems and expectations from students between Arabic countries and those in the West such as Australia (Heyn 2013), and not seeing themselves as a locus of control for their learning (Silverman and Casazza 2000) as cited in Shaw (2009). Many international students from nonnative English speaking (NNES) backgrounds are not familiar, and find it hard to cope, with the Western learning system with its expectation that learners are independent (Ringer et al. 2010). Issues commonly faced by international students include:

1. Level of competency with the English language, although they may have passed the English language requirement along with difficulties in being understood by the lecturers (Bone and Reid 2013)

2. The difference in pedagogical approach between Western universities and home countries where there is a teacher-centred classroom environment (Alshehri 2001) in contrast to the learner-centered (Islam and Borland 2006) approach to assessments and assignments

3. Cultural appropriateness of some of the course content which can result in inadequate performance of students who struggle to adjust to Australian learning environments (Burke and Wyatt-Smith 1996)

International students need to be aware of and understand the principles underpinning their new learning experiences and their teachers' expectations. Conversely, universities need to be aware of these differences and provide avenues that mitigate their unsurprising critical views regarding the typical Western learning environment and its seemingly conflicting underpinning philosophy. "If a university enrols students from linguistically and culturally different backgrounds then it is the university's duty to develop the knowledge and capabilities of these students in order for them to be able to respond effectively to the new cultural contexts in which they are studying" (Crichton et al. 2004, p. 71). Further, university educators themselves may not be aware of the impact that cultural and linguistic differences may have on international students' learning experiences.

Improving the quality of the educational services requires understanding student's needs, specifically international students who may be considered to be the most important customers for educational organizations these days, because they not only contribute to the profit of this sector, but also to reputation which is increasingly essential for educational organizations. Arabic international students experience different kinds of services when they start studying at Australian universities. According to Cuthbert (1996), the essential factor in higher education is the quality of the service experience. There are a number of areas where the transactional nature of the relationship lends itself to a customer satisfaction perspective in the student services and support areas (admissions and enrolment management, bursar's office/financial aid, bookstore, orientation, dining services, housing, student activities, counseling and health services, career counseling, international students office, library, learning centers, etc.) and to a lesser extent in academic areas (research, academic integrity/appeals, academic advisement, etc.), depending on organizational context (Hines 1984).

This chapter refers to a study that will focus on improving the quality of the postgraduate student experience for international students at Australian higher education institutions through the application of QFD. The QFD technique has been introduced and used in many fields, such as government, banking and accounting, health care, hospitality, information technology, and research (Andronikidis et al. 2009; Singh et al. 2008; Vinayak and Kodali 2013). QFD can be more than a planning tool. If properly deployed, it can become a key element of an organization's systemic learning process and quality system (Huber 1991; Tague 2005). The QFD approach and its utilization of the voice of the customer and the language they use can be an integral part of quality control measures (Fuchs 1999) throughout the university. Such an approach provides higher education institutions with a systematic process to identify and respond to student needs in a timely and more proactive

manner – addressing a challenge many universities face throughout the world (Zeine et al. 2014). QFD's benefits are that it provides an additional informational link that identifies requirements that processes should address, and establishes a process whereby customer needs can be identified and translated into action in an ever-changing environment (Bouchereau and Rowlands 2000). As Early and Coletti (1999) pointed out:

> Customer needs keep changing. There is no such thing as a final list of customer needs...
> [Forces such as technology, competition, social change, and so on can create new customer needs or may change the priority given to existing needs] (p. 3.16).

QFD is people-based, bringing together customers and an organization's multi-functional teams to help formulate how needs are either directly addressed, or trade-offs negotiated between customer wants and what institutions can afford to do (Bouchereau and Rowlands 2000). There are logistical as well as support issues that impact the environment, engagement, and satisfaction of international students. Historical practice at Australian universities has been to provide support services that act as an intermediary between international students, their families, and the university's learning and teaching communities (Robertson et al. 2000). However, the literature suggests that efforts from these units have not been as successful as they should be (Slethaug and Manjula 2012). Investigating the usefulness of QFD techniques to improve the experiences of Arabic international students paves the way to determining its usefulness in resolving related issues with other international student subgroups by providing higher education institutions with a formal approach to capturing and responding to the customer's needs to improve the quality of the services (academic, personal, and social) and increase the customer's satisfaction sequentially. To sum up, it is clear that there has been little research performed about Arabic internatioanal students experiences and their requirements to succeed in Western education contexts.

Literature Review

This section presents the key themes in the literature that apply to the study discussed in this chapter. The aim of this section is to build the theoretical foundation upon which the study is based by reviewing the relevant literature.

Theories Underpinning the Research

The study's conceptual framework is underpinned by the two major theories: total quality management (TQM) theory and social identity theory. These are contextualized into the higher education environment by Astin's (1985, 1993) inputs-environment-outcomes model of student engagement and learning.

TQM

Quality refers to the features and characteristics of a product or service that bear on its ability to satisfy stated and implied requirements of the customer (Singal 2012). TQM is a philosophy which promotes an organization-wide effort to achieve quality and whose aim is to actively involve staff in the pursuit of quality and to infuse in them the spirit of continuous improvement. It focuses primarily on total satisfaction for both internal and external customers within a managerial environment that seeks continuous improvement of all systems (Hongen and Xianwei 1996) focusing on continuous improvement of skills, team work, processes, product and service quality, and customer service (CS) (Singal 2012). This definition is anchored to organizational culture because successful TQM is deeply embedded in every aspect of organizational life and calling for the satisfaction of customers. To achieve this, three components of TQM are essential (Singal 2012):

- Meeting customer requirements (CR)
- Continuous improvement through management processes
- Involvement of all employees

One of the most powerful tools to appear under the TQM umbrella is QFD (Jiang et al. 2007; Murgatroyd and Morgan 1993; Shekhar and Arora 2012). QFD highlights TQM's continuous customer-centred employee-driven improvement approach. "Delighting the customer" is the rule for survival in the long run and is its core message (Sahney et al. 2004a).

TQM in Higher Education

Although quality has always been a focus for higher education institutions globally, defining quality in higher education remains a contested issue (Kalayci et al. 2012). The concept of quality when applied to higher education is a complex concept that has no conclusive definition (Marshall 1998; Sahney et al. 2006). TQM in higher education institutions is not a simple issue based on the inputs, processes, and outputs that make up a higher education institution (Qureshi et al. 2012; Sahney et al. 2004a).

Intangibility and lack of physical evidence of service makes perceptions of service quality a complex proposition and poses difficulties for measurement and analysis (Mahapatra and Khan 2007; Parasuraman et al. 1985). The outcomes are linked to transformation of knowledge in individuals and change in their behavior (Pascarella and Terenzini 2005). Because the transformation and the environments generating the transformation focus on so many different issues, there is no mutually accepted definition of quality which can be applied to the higher education sector (Qureshi et al. 2012). Nevertheless, numerous universities strive to improve the quality of their education systems and make themselves distinctive from the rest by applying TQM tools and techniques (Aly and Akpovi 2001).

Customers in Higher Education

Generally, in a service sector, a customer is anyone being served. Customers may be both internal and external, depending on whether they are located within or outside the organization. Quality starts with customers and is defined by customers (Jamali et al. 2010). Indeed, Scrabec (2000, p. 298) believes that the "the inability to classify customers is at the heart of failed TQM efforts in education." Identifying customers is essential in order to determine specific needs and maintain customer-oriented service. In higher education, the various categories of customers have been identified and correlated with inputs. As the student is also part of the input, among others (e.g., employer), the best method of resolving different interests is to recognize their existence and to look for issues that unite the different parties (Sahney et al. 2004b). Thus, despite higher education having a number of complementary and contradictory issues about defining the higher education customer (e.g., due to demands for increasing student enrolments, pressure to satisfy the students' desires for higher grades, and student evaluations becoming the primary indicator for teaching effectiveness) (Bailey and Dangerfield 2000; Eagle and Brennan 2007; Svensson and Wood 2007), there are distinct transactional aspects within a university suggesting the appropriateness of identifying students as one of the principal customers served by higher education.

Social Identity Theory

Studies by Finney and Finney (2010), Shah et al. (2013), and Watjatrakul (2014) show that student perceptions are linked to engagement, with satisfaction linked to the improvement of service quality and ease in achieving course outcomes. The theory of social identity is relevant to the current study because it points to the importance of understanding the feelings of international students and its relevance to their sense of satisfaction and wellbeing.

Social identity theory (Tajfel and Turner 1986) provides a framework through which international students and Arabic international students perceptions can be understood, assisting universities in the challenge of identifying and meeting their needs. It provides a coherent, intergroup perspective relating to a person's identification with and within the organization and the organizational commitment (Ashforth and Mael 1989; Tajfel and Turner 1979) based on their interactions and associated success or failure. International students may tend to limit their opportunity to interact with others from outside their circle or who have a different cultural background, impacting on capacity to establish a common understanding about many issues. Arabic international students, as a group of international students, can therefore find themselves experiencing less communication with the local community, which is likely to have a serious impact on their development of English for academic and social and purposes (Al-Mansouri 2014).

Astin's I-E-O Model

Astin's (1985, 1993) input-evaluation-outcomes model provides a conceptual and methodological guide to the study of the effects higher education institutions have on students, emphasizing the learning and teaching aspects of university activity (Inkelas et al. 2011; Pascarella et al. 2005). It highlights the longitudinal nature of the higher education learning experience and the interactivity between student background characteristics and the higher education environment, placing these in the broader institution framework context (Kelly 1996). "The I-E-O model was designed to address the basic methodological problem with all nonexperimental studies in the social sciences, namely the nonrandom assignment of people (inputs) to programs (environments)" (Astin and Sax 1988, p. 252) .

Universities are systems of interrelated components that transact within complex and interrelated internal and external environments, requiring them to continually assess organizational performance and effectiveness (Hayes 2002) for organizational learning and accountability purposes.

Fig. 1 illustrates the various elements of Astin's I-E-O model and where QFD fits within Astin's model. Inputs influence the environmental experience of students in relationship of achieving desired outcomes (institutional and personal).

Theoretical Background of QFD

Origination of QFD

The terms quality function deployment are transliteration of the Japanese *Hin Shitsu* (quality), *Ki Nou* (function), and *Ten Kai* (deployment) (Singh et al. 2008). QFD originated in the late 1960s in Japan (Akao and Mazur 2003; Foster 2010; Vinayak and Kodali 2013). It was introduced to the United States (USA) in 1983 and then to the remainder of the Western world, finding widespread acceptance as an effective quality tool (Goetsch and Davis 2010; Prabhushankar et al. 2015; Singh et al. 2008).
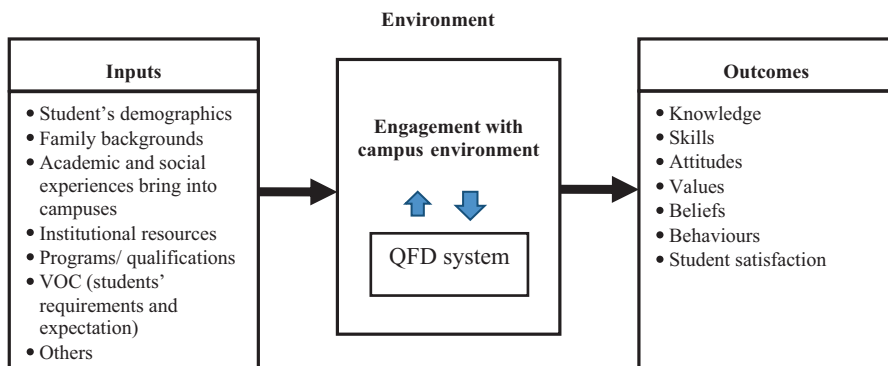

Fig. 1 Astin's I-E-O model (Source: Adapted from (Padró and Kek 2013))

It has been widely applied in aerospace, software, engineering, construction, and marketing. In the United Kingdom (UK), the uptake of QFD techniques is more recent and there are only a few scattered cases of companies trying to experiment with it (Zairi and Youssef 1995). QFD has also been successfully used in service sectors such as government, education, e-banking, accounting, healthcare, hospitality, public sector, retail, technical libraries, and information services (Andronikidis et al. 2009; Sahney et al. 2004a). The literature provides examples of QFD use in higher education from as far back as the early 1990s. It has been applied for analysis and design in the fields of education quality, service quality, educational research, software development, teaching effectiveness, curriculum design, training, instructional resources, and marketing planning (Chien and Su 2003; Eftekhar et al. 2012; Karanjekar et al. 2013b; Mukaddes et al. 2012; Prabhushankar et al. 2015).

QFD Concept

Quality function deployment (QFD) is an important tool used in TQM, which can be applied for process and design improvement in manufacturing or services sectors (Karanjekar et al. 2013a; Qureshi et al. 2012; Raharjo et al. 2007; Shen et al. 2000; Singh et al. 2008; Tsinidou et al. 2010). QFD translates the voice of customer (VOC), or CR, into the final product and/or service quality to assure customer satisfaction (CS) (Akao 1990). The main goal of QFD is enhanced CS, organizational integration of expressed customer wants and needs, and improved profitability (Griffin 1992). It is a productivity improvement tool that helps organizations to achieve and maintain competitive advantages by striving for world-class performance (Vinayak and Kodali 2013). QFD is developed by involvement of a cross-functional team and provides an interdepartmental approach to communication that creates a common quality focus across all functions/operations in an organization (Andronikidis et al. 2009). Teams work to define the customer, and the customer's wants (the "whats"), the "hows" (the mechanisms to satisfy the customer's wants) and the relationships between these "whats" and "hows," assigning value weights to each using a matrix known as a "House of Quality" (Pitman et al. 1996).

QFD works within quality systems that aim to satisfy the customer (Mazur 1996). It concentrates on maximizing CS and delivering "value" by discovering spoken and unspoken CR, translating CR into actionable service or product features, and communicating them throughout an organization (Mazur 1993). In other words, QFD can be referred to as designed-in quality rather than traditional inspected-in quality (Chan and Wu 2002). The three main goals in implementing QFD are (Gupta et al. 2012, p. 896):

1. Prioritize spoken and unspoken customer wants and needs.
2. Translate these needs into technical characteristics and specifications.
3. Build and deliver a quality product or service by focusing everybody toward CS.

To achieve all these goals, Motwani et al. (1996) stressed that QFD process requires:

1. Involvement of a cross-functional team
2. The QFD process itself
3. The visual matrix that guides the process

The House of Quality

QFD involves the construction of one or more matrices, called "quality tables" that guide the decisions that must be made throughout development process (Cohen 1995). The first of these "quality tables," called "The House of Quality (HOQ)," is the most commonly used matrix in QFD (Andronikidis et al. 2009). Essentially, HOQ is the central component in constructing QFD (An 2011). The HOQ matrix style chart correlates the identified customer attributes ("whats") with the technical requirements (TR) ("hows"). A multidisciplinary team draws upon market research and benchmarking data to translate customer requirements into an appropriate number of prioritized technical targets (Prabhushankar et al. 2015). A typical HOQ is shown in Fig. 2. Building the House of Quality involves the following steps:

1-. Identify a list of customer requirements (CR)
2-. Develop a listing of technical requirements (TR)
3-. Develop a relationship matrix between the CR and the TR
4-. Planning matrix
5-. Technical correlation matrix
6-. Priorities of technical requirements (TR) matrix

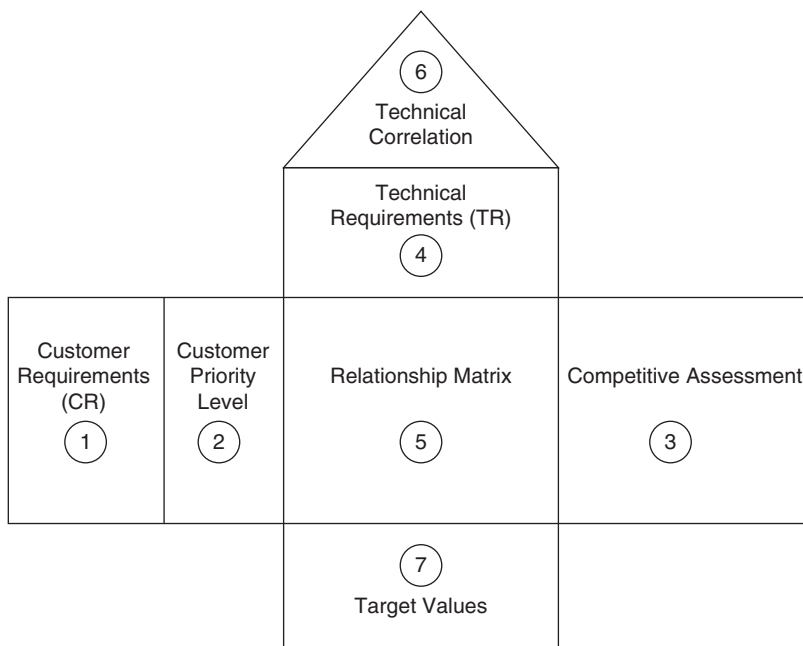**Fig. 2** General House of Quality (Source: Garibay et al. 2010; Russel and Taylor 2003)

Applications of QFD in Higher Education

The literature on the use of QFD in higher education can be categorized into four major parts: curriculum design, teaching effectiveness, educational service quality, and other applications (Ahmed 2006; Eftekhar et al. 2012; Hwarng and Teo 2001; Mukaddes et al. 2012). For example, the literature on the application of QFD to curriculum design is increasing (Gonzalez et al. 2011). Teaching effectiveness QFD studies concentrate on programs as well as lifelong learning (Mukaddes et al. 2010). QFD has proven to be an effective tool for translating the student's requirements into teaching techniques (Mukaddes et al. 2012). Studies on educational service quality looked at improvement by identifying the gaps between perceived and expected quality by the students as users. Based on the findings of these studies, QFD is an effective approach for translating stakeholders' needs into technical requirements. A review of the literature on the use of QFD in higher education identified two gaps:

- Limited attention has been given to its use regarding the interaction between higher education institutions and international students.
- Most studies are based on single institutions and not at the higher education system level.

Research Methodology

This research is utilizing a mixed methods approach based on application of the House of Quality (HOQ) as the main tool of QFD technique. Per QFD methodology, this research will collect qualitative data from Arabic international students (for establishing CRs) and relevant staff members (for identifying TRs) and then translate it into quantitative data to calculate the rest of the QFD matrices.

Research Framework

Figure 3 illustrates the research process utilized in this study. It is based on the HOQ as a main matrix of QFD, with focus groups as the basis for developing key criteria and interviews to provide data for predictive formulae that are the basis of QFD planning and decision making. Student's requirements (SRs) and Institutional requirements (IRs) are informed by the elements of Astin's (1985, 1993) I-E-O model as these help frame the key input, environmental, and outcome linkages that characterize these requirements and provide the context for the results of the QFD process.

Application of the House of Quality Matrix

QFD is the method proposed for the design and improvement of educational experiences based on student requirements and benchmarking obtained from
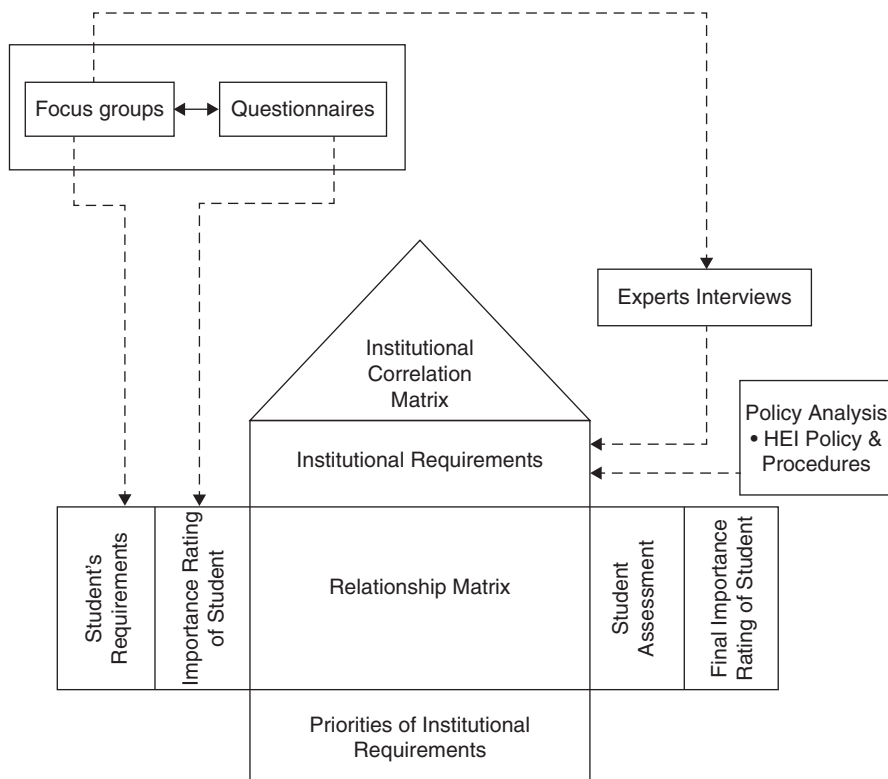
Fig. 3 Research framework (Source: Adapted from (Yeh and Chen 2014)

universities in Queensland. The construction of the QFD matrix is illustrated through the HOQ detailed description in Fig. 4. In this figure, the QFD has six parts that have to be executed in order to reach the desired outcome of the technical priorities. Building the QFD matrix involves the following steps:

Step-1: To begin the QFD process, the university seeks to capture the needs of the students. The voices of the students and their requirements are collected and verified through questions and focus groups discussions with Arabic international students who are enrolled in different schools in the university.

Step-2: This step deals with the Institutional Requirements (IR) that are associated with the student's needs and expectations. The goal of the HOQ is to design or change the design of a service in a way that meets or exceeds the student's requirements. The QFD team must come up with service element or social and academic experiences techniques that will affect one or more of the student requirements. The information on IR is collected from the staff. Each IR must directly affect a student perception and be expressed in measurable terms. The QFD team then summarises the suggestions and reduces their number by combining different techniques.
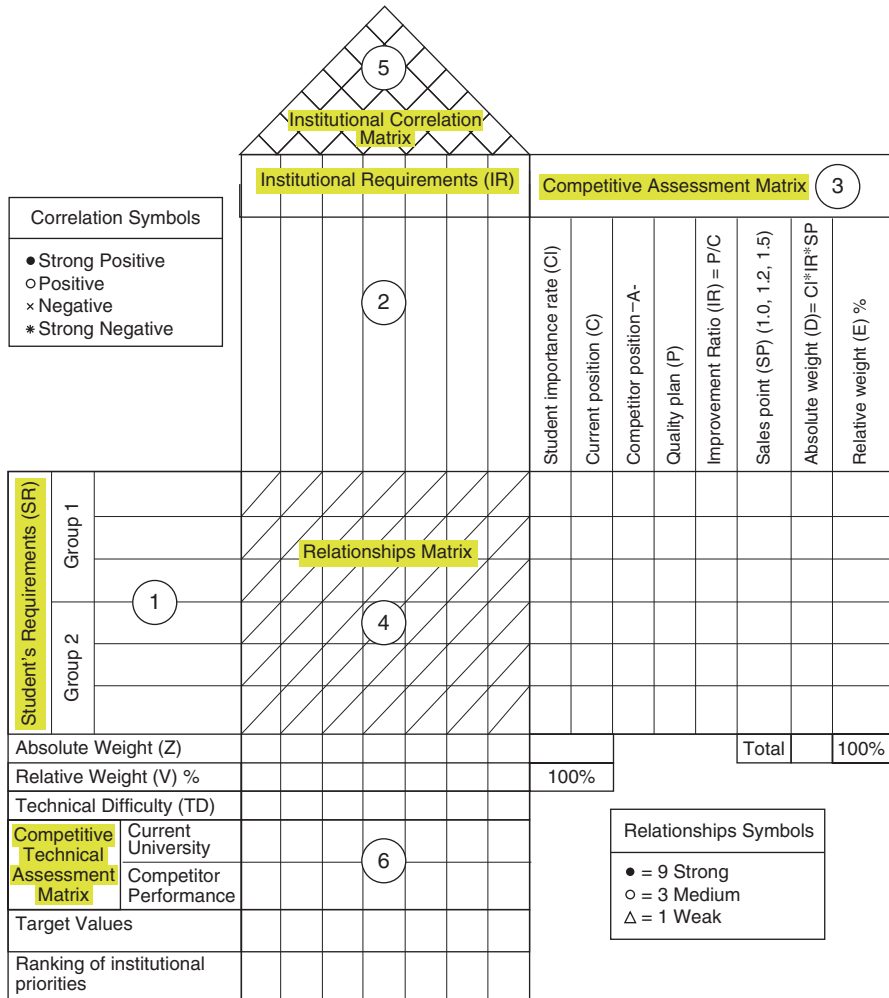
Fig. 4 The House of Quality – detailed description (Source: Adapted from (Talib and Maguad 2011)

Step-3: This step develops the relationship matrix showing the level of association/influence between each student need and each institutional requirement the university is providing. These relationships coefficients are calculated and represented in the form of symbols which are further quantified to show the strength of association (Talib and Maguad 2011).

- ● = 9 (Strong association)
- ○ = 3 (Somewhat association/medium relationship)
- Δ = 1 (Weak association)
- Blank = 0 (No association or relationship)

The blank quadrant represents no relationship. The relationship matrix is completed by the QFD team/focus group (Mukaddes et al. 2012).

Step-4: This step, being the roof of the HOQ, shows intercorrelations between the IR provided by the university. The purpose of calculating intercorrelations is to show whether there is association, supporting behavior or conflict, between each of the institutional requirements. The correlation coefficients are calculated and represented in the form of symbols which are further represented by the numbers to show the direction and the strength of association. This interrelationship matrix is also prepared by the QFD team/focus group (Chin et al. 2001; Mukaddes et al. 2012; Talib and Maguad 2011).

– • = (Strong positive association)
– ○ = (Positive association)
– × = (Negative association)
– * = (Strong negative association)

Step-5: This step is used for developing the desires/priority-based student requirements. These are categorized into columns of the HOQ in order of importance to the customer. The students' focus group rates the importance of each of the student requirements. These ratings are assigned 1 through 5, with 1 indicating the least importance to students and 5 being very essential to students. The target values are set on scale 1 through 5 with 1 being "no change," 3 "improvement is needed," and 5 "make it better than the competitor."

– **Importance to customer:** A focus group ranks each customer (student) requirement by assigning it a rating. Numbers 1–5 are listed in the importance to student column to indicate a rating 1 for least important and 5 for very important (Talib and Maguad 2011).
– **Target value:** The target value column is on the same scale as the customer competitive assessment (1 for worst and 5 for best). This is where the QFD team decides whether they want to keep their service unchanged, improve the service, or make the service better than the competitor.
– **Scale-up factor:** The scale-up factor is the ratio of the target value to the service rating given in the customer competitive assessment (Mukaddes et al. 2012). The higher the number, the more effort will be needed to achieve the target. The important consideration is deciding whether the difference between the current level of service and the target rating can be explained and achieved. It is calculated by dividing the planned level by the current university rating in the following formula (Chin et al. 2001; Hamza 2011):

$$SF_i = T_i/N_i \tag{1}$$

where T_i is the target value by assessment of the university position for achieving the students' requirement and N_i is the current assessment of the university position for achieving the students' requirement.

– **Service point (sales point):** The service point tells the QFD team how well a student requirement will contribute to service improvement. The objective is to promote the best student requirements and any remaining student requirements that will help improve the service. Here, the service point is a value between 1.0 and 2.0 (Mukaddes et al. 2012).
– **Absolute weight:** Finally, the absolute weight is calculated by multiplying the importance to customer, scale-up factor, and service point (Aghlmand et al. 2010; Mukaddes et al. 2012; Talib and Maguad 2011).

$$\text{Absolute weight } (D_i) = \text{Importance to customer } (C_i) \\ \times \text{Scale-up factor } (SF_i) \times \text{Service point } (SP_i) \quad (2)$$

Relative weight: The relative weight for the ith customer descriptor is then given by replacing the degree of importance for the customer

$$Ei = \frac{Di}{\sum\limits_{i=0}^{n} Di} \cdot 100 \quad (3)$$

where E_i = the relative weight for the ith customer descriptor.

Step-6: The prioritized institutional descriptors contain degree of technical difficulty, target value, and absolute and relative weights. The QFD team identifies institutional descriptors that are most needed to fulfil student requirements and require further improvement.

– **Degree of difficulty:** The degree of the institutional difficulty helps to evaluate the ability to implement techniques to fulfil student's requirements. A difficulty rating (1–5 point scale, 5 being very difficult and risky) is calculated for each subsystem/subassembly/part requirement or institutional characteristics (Mukaddes et al. 2010; Mukaddes et al. 2012).
– **Target value:** This objective measure defines values that must be obtained to achieve the institutional descriptor. How much it takes to meet or exceed the students' expectations is answered by evaluating all the information entered into the HOQ and selecting target values.
– **Absolute weight:** The last two rows of prioritized institutional descriptors are the absolute weight and relative weight. Absolute weight for the jth institutional descriptor is then given by (Chan and Wu 2005; Talib and Maguad 2011):

$$Z_j = \sum_{i=0}^{n} R_{ij} \quad E_i \tag{4}$$

Z_j = Absolute weight row vector for the institutional requirement.
R_{ij} = Strength of association to the relationships matrix ($i = 1 \ldots n$ and $j = 1 \ldots m$).
m = number of institutional requirement and n = number of student requirement.

Relative weights: In a similar manner, the relative weight for the *j*th institutional descriptor is then given by replacing the degree of importance for the SR with the absolute weight for the SR. The relative weights are found by calculating the sum of the products of the relationships between students and IR and absolute weight of the student's requirements.

$$V_i = \frac{Z_j}{\sum_{j=0}^{m} Z_j} \cdot 100 \tag{5}$$

where V_j = Relative weights for the institutional requirement row vector.

The QFD team then identifies the prioritized institutional requirement which contains the degree of difficulty, target value, and absolute and relative weights. Ultimately, QFD team identifies IRs that are most needed to fulfil the student requirements and need further improvement. In other words, the higher relative weight indicates giving the more concentration by university on the IRs to satisfy the student's requirements (Foster and Ganguly 2007; Mukaddes et al. 2010).

Data Analysis Techniques

For the qualitative data, all focus groups and semistructured interviews will be audio recorded for later analysis. First, data will be transcribed and then stored. Second, the data will be analyzed using NVivo. For the quantitative data, the statistical software package SPSS version 22 will be used. Initially, descriptive statistics for data gathered through the questionnaires will be analyzed using IPA (Importance-Performance Analysis) to contextualize and transform the data into quantitative formulae to complete the QFD matrix.

Discussion and Recommendations

This chapter and the associated study demonstrate that the QFD technique can be used to assess and fulfil students' requirements by evaluating the effectiveness of social and academic experinces of postgraduate Arabic students in higher education. In this regard, the application of the QFD tool for improvement of educational experinces clearly implies a paradigm shift from the view of students as passive customers of information to active participants in the achievement of educational

goals. The developed HOQ reveals the needs of the students and the characteristics of the discipline-specific quality service processes. This is achieved by the QFD team interacting with the Arabic students during their postgraduate studies and delivering quality services. This chapter highlights the need to reduce negative experiences of postgraduate Arabic students through better understanding their requirements via the voice of customer and to therefore deliver better value to them as customers. Further, university management is able to participate, plan, and allocate resources to achieve measurable results. Application of QFD will therefore be useful in for postgraduate and other service areas within higher education institutions across Australia and other service industries. However, prior to applying QFD, organizations need greater awareness of the process and the benefits that could result from use of QFD.

There are three main recommendations for higher education institutions across Australia that arise from the study and techniques discussed in this chapter:

1. Adopting the QFD technique in higher education and other service industries can be a powerful tool for improvement of the service operation.
2. QFD may be used to track and measure quality in performance of higher education institutions, providing the opportunity to investigate whether continuous improvements in service can lead to better business performance.
3. Marketing has a limited role in achieving total quality management in higher education, but QFD can offer a niche to benefit marketing efforts, as well as advance overall organizational objectives by developing better services that meet customer demands.

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