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Applying Quality Function Deployment Approach to Design an English as a Foreign Language Writing Course for Engineering Students

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Abstract: The study attempts to incorporate the Quality Function Deployment (QFD) to be integrated strategically in designing and managing a writing course within an English learning system. Understanding the user's needs in these communities has become the first priority of learning systems for designing, running and managing effective learning services to meet the increasing expectations of the users. To achieve this, the learning system strives to improve their quality of service by applying a wide range of such quality management approaches as QFD. QFD initially stresses on driving continuous improvement of the user-oriented services towards end-user satisfaction.

Key words: English learning system, writing course design, quality function development, user-oriented services

INTRODUCTION

Migration from the traditional to modern learning paradigm is usually accompanied by remodeling of many learning core activities particularly those associated with user-centered services. In this capacity of the modern learning paradigm, many educational communities have been established. Dialogue as mode of pedagogical communication has come to occupy a central role in the praxis of critical pedagogy. In fact, it has become almost a truism to say that critical pedagogy must be fundamentally dialogical. I would like to begin by describing the theoretical influence behind this assumption.

The line of influence is Socrates himself. His self-proclaimed role as a gadfly, the nonconforming anti-authoritarian who speaks truth to power, meshes perfectly with the self-image of the critic. His trial for sedition, his subsequent refusal to bow before state power and his acceptance of suicide over compromise, are inspiring to radicals everywhere. The core idea of Socratic pedagogy, that any learner (even a humble slave boy) already has knowledge within, waiting only to be brought forth by a patient tutor, seems inclusive and democratic. The so-called Socratic method (Burbules, 1993) seems to be the epitome of a respectful, non-authoritarian way of teaching, drawing out rather than pouring in, questioning and probing rather than pontificating. The fact that all of this may represent a partial and sometimes inaccurate representation of Socrates is an argument for another time but this version of Socrates has held sway over many writers and teachers in the critical tradition.

The origins of contemporary critical pedagogy, of course, can be traced even more directly to the Brazilian educator and educational theorist, Paulo Freire. It was arguably Freire, more than anyone else, who put the idea of dialogue at the center of what he called liberating or emancipatory pedagogy. Dialogue was opposed to monologue, or what Freire termed the banking method of education, an authoritarian style of teaching that mirrored the authoritarian structure of society (Paulo, 1970). Just as the oppressed were subjugated by the oppressors, treated as lesser human beings, the audience to a monologue is treated with disrespect, as a passive recipient of knowledge, not as one capable of contributing to knowledge. In dialogue, on the other hand, the teacher and learner are joined in a shared act of inquiry and meaning-making. The egalitarian structure of Freirean dialogue, its commitment to reciprocity and to empowering the oppressed through the development of critical literacy and through engagement in socially transformative praxies, and its constructivist (or one might say co-constructivist) view of knowledge, all mirror values that are strongly held by critical educators. For many writers in the critical pedagogy camp the interpretation, elaboration and application of Freire's ideas remain the core of progressive theory and practice.

Critical pedagogy has many versions today, as does critical theory. With important differences between critical theories and the variety of critical pedagogies, identifying the problems of current critical pedagogies becomes problematic and the development of a positive utopian alternative critical pedagogy becomes impossible.

For all their differences, all current versions of critical pedagogy function as part and parcel of normalizing education and its violence.

We live in an audit society characterized by a culture and technology of performance management and corporate accountability (Power, 1999). This culture has become deeply rooted in the governance of education, reflecting the economic imperatives of new capitalism. The new principles of work, such as practices of institutional control, market relevance and accountability, extend into every corner of education faculties—from the curriculum and pedagogy of engineering students' education programs to the organization of research activities. This means increasingly improving the standards of teaching and research, competing for funding and students and being subjected to internal auditing mechanisms, such as client satisfaction surveys, as well as external pressures by governments to produce graduates with certain attributes. New managerialism and the rituals of performance surveillance bite deeply into the identities and activities of engineering students educators. These practices produce new subjectivities for engineering students educators and a particular set of practices which mediate their understandings of selves and relationships with others as they try to cope with the accelerated pace of internal and external pressures (Ball, 2001). These inside out and outside in controls and performance pressures generate identities disciplined by imposed targets and performance indicators, causing people to rethink what counts as engineering students' education and engineering students' professionalism.

A successful performance in a writing task, from a managerial perspective, often equates with the reproduction of dominant knowledge and the ability to demonstrate this through an expression of one's individual viewpoint. Students must typically demonstrate a mastery of formal writing genres such as the academic essay, thereby affirming their ownership of what they write. Students-as-authors have this obligation not only to display their ability to engage fully in the production of meaningful text but also to do this under the pressure of topics, purposes and criteria articulated in unit assessment tasks. They are obliged to find their voice in a situation. Everything seems to be pinned down in advance in the form of pre-specified graduate attributes, unit outcomes that reflect those attributes and formal assessment tasks that show individual students have achieved those unit outcomes.

This approach to writing pedagogy has been contested at least in some critical circles of educators. Outcomes ideology in engineering students' education works to make sure that dominant meanings, which

underlie the regulatory discourse of what counts as engineering students' professionalism, are not questioned. By constructing dialogic classroom learning as a unitary and progressive movement towards imagined professional standards, managerial discourse disregards the fact that internalization of knowledge is caught up in a complex web of power relations-relations which, according to Foucault (1986), connect power and knowledge and which are constituted through language and social practice. Therefore, from a critical perspective on writing in engineering students' education, student voice can not be perceived simply as an individual expression of the creative subject who produces and owns the text. What students write depends on the complex interaction between the ideology of engineering students' education, available textual resources, pedagogical practices, student locations in the sociocultural milieu and their ways of appropriating the words and voices of others. The aim of this study is to design a writing course based on the requirements of the students. Learning functions and academic learning requirements are inextricably linked. This statement can be translated into: (i) quality of learning services, (ii) efficiency of delivery system and (iii) satisfaction of learning consumers. These components motivated educational centers in incorporating a wide range of quality management approaches (e.g., quality function deployment (QFD)) as an effective means of incorporating quality improvement in their user-centered information services. Learning services can be illustrated as open interrelated systems with input-output interoperability where the education administration should maintain user-oriented collection development and learning commons as an input and end-user satisfaction as output (Hsieh *et al.*, 2000). Quality Function Deployment (QFD), Akao the voice of the customer is a problem prevention tool. This model is a systematic method for structured product planning and development that enables developers to clearly identify customers' (students') wants and needs and then evaluate each proposed component or service capability systematically in terms of its impact on meeting the expressed desires of the customer.

QFD was conceived by Yoji Akao during the late 60's in Japan. However, it was not until 1972, that QFD was publicly recognized when applied at the Mitsubishi shipyards in Japan. QFD was first introduced by two interrelated objectives (Akao, 1997; Akao and Mazur, 2003), these were:

- To convert the core desire, demand and need of the end-users for interesting products into substitute quality characteristics (SQC) at different stages of design and testing

- To assure that SQC is properly deployed throughout the processes of manufacturing, production and delivery of new products or services

If the producer succeeded in bringing the two objectives together, its product would meet the satisfaction of the end-users (Han *et al.*, 2001). Moreover, we can view QFD as a fundamental trade-off between the end-users and the producers. The QFD has been experienced a vast range of development and modifications to yield a rigorous analytic tool to understand end-user behavior for developing comprehensive product and service specifications through creating end-user strategies and developing a mechanism for enabling such strategies (Killen *et al.*, 2005).

With its roots originally planted in the industrial sectors, QFD has now found acceptance in departmental research in education. These applications range from textbook selection to redesign of departmental business operations. Regardless of the application, the QFD process consists of four primary areas of focus (Fig. 1). The details of each component go beyond the scope of this study and should be investigated as a separate issue for faculty unfamiliar with QFD. The general QFD application focus areas and their operational definitions are as follows:

- Product planning-content and audience analysis
- Part deployment-development of course objectives
- Process planning-course activities and instructional methods
- Production planning-delivery techniques

PRODUCT PLANNING STAGE

The initial phase of the QFD is the product planning stage. During this stage the purpose is to acquire students' input to define the characteristics of a writing course. Obtaining student information can be accomplished through personal interviews, focus groups, telephone calls, surveys (writing journals), or whatever methods are available. The primary goal is to elicit feedback from those who have taken a writing course and input from those who are interested in taking a writing course. In addition, faculty must analyze course goals and content to determine course objectives. Product planning is the most critical and difficult step of the process. Maintaining objectivity and capturing the essence of the students' needs and expectations is vital to ensuring a successful English learning experience while analyzing course content is the first step in ensuring that the course is instructionally sound.

In trying to achieve the ideal English learning experience faculty should begin by asking the following types of questions:

- Who are the students? Is this course a requirement for them or an elective? Are they academically mature?
- What are their needs?
- Where does this course fit into the curriculum?
- What content should be taught in this course?

After the data is collected and categorized through the use of affinity diagrams the process moves toward the creation of the initial House of Quality (HOQ)

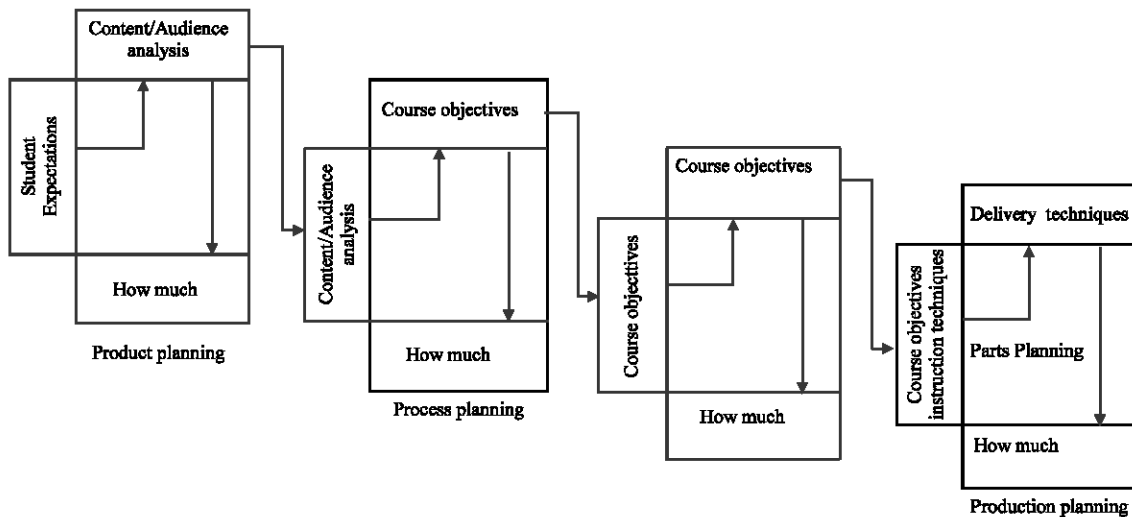


Fig. 1: Quality function deployment stages

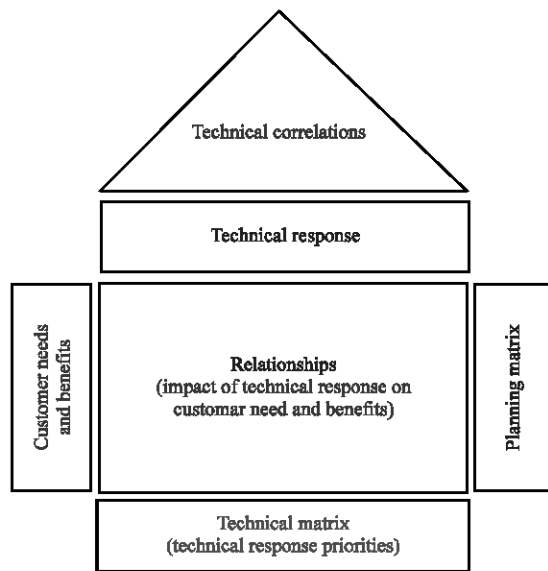


Fig. 2: House of Quality (HOQ)

(Fig. 2). The course elements that gain top priority are then shifted to the next House of Quality to begin the part deployment stage.

PART DEVELOPMENT STAGE

During the part deployment phase faculty are required to establish course objectives to ensure the course meets curricular requirements and is instructionally sound. In doing so, faculty should continue to analyze course content and student needs. At this point in the process, faculty must be careful not to compromise the instructional integrity of the course. The writing of objectives and test items is not to be taken lightly. Objectives are the infrastructure upon which instructional experiences are built. However, proper writing of objectives goes far beyond the scope of this study and therefore could not be addressed thoroughly in this format. Faculty members are encouraged to pursue additional guidance on the writing of objectives in order to ensure it is done properly. The following types of questions might be used to initiate the process.

- What are the course objectives?
- What instructional activities will facilitate the meeting of course objectives?
- What types of test items, or other means of evaluation, will be used to determine whether, or not, students master the content and meet course objectives?

PROCESS PLANNING STAGE

Process planning is used to focus on the technical operations of the writing course. However, through the use of QFD we can structure the learning processes to best suit our students. As the course development process begins, faculty must consider the style of writing instruction and the learning styles of the students. Due to the diversity of student learning styles and academic maturity it is beneficial for instructors to utilize several different instructional approaches and activities. The acknowledgment of this incongruence should serve as a design consideration to avoid producing dysfunctional writing courses. Although it is humanly impossible to meet the needs of all students in face-to-face environments, technology has made it possible to offer several varieties of learning activities to engage students in an English system.

Developing a variety of activities to address students' needs can prove to be a formidable task. Providing students multiple options for learning course materials has proven to be effective. Additionally, the availability of options has the potential to facilitate an opportunity to help students learn or acquire information in alternate methods. In general, the choice of media for any learning activity will of course be heavily influenced by the range of issues related to how and when the activities will be undertaken by the students.

In order to ensure that the quality of a course is enhanced by the activities, faculty must address the following:

- Which course objective is addressed by each activity?
- What, exactly will students gain from engaging in the prescribed activities?
- Is the value of the activities obvious to students?

As course content and activities will vary, instructors are encouraged to continue the questioning process as needed for their writing course(s). Overall, writing activities must support course objectives in a manner that is meaningful to students and instructionally sound.

PRODUCTION PLANNING STAGE

The last stage of the QFD process is the production planning. The goal of the production planning stage is to outline and structure the material, activities and technologies necessary to deliver the course. The variety of writing course delivery systems currently available allows institutions to choose from several options.

THE OTHER FINAL STAGE (EVALUATION)

Although the production planning stage is referred to as the last stage this is not actually the case where course design and development is concerned. Upon completion of the production planning stage faculty should have a working prototype of the course. As with all prototypes, a thorough review of the writing course should be performed before it is deployed. A good method of evaluation would be to use a small group of students to pilot the course as an alternate delivery to a current face-to-face course. The feedback from these students will be necessary to see if the course design is effective. Once a beta-test of the course has been conducted the course will be either revised or packaged for use.

CONCLUSIONS

Well-developed writing courses that facilitate learning experiences are not common place. They are overshadowed by the multitude of correspondence courses. As faculty set out to design a writing course they should give thought to the entire process, from development to deployment. Otherwise, they can create frustration for themselves and their students. Quality Function Deployment (QFD) can be useful in the course development process. It is a simple, yet powerful, means of discovering key characteristics of a successful writing course. Being proactive and using QFD principles properly will help faculty to identify instructional design and technical concerns early in the design process. Utilizing QFD early in the planning stages of a writing course will minimize frustration and maximize the learning process. Both of which can lead to a strong English experience for students and faculty. The use of Quality Function Deployment and contemporary instructional design models can assist in the successful design of a writing course. Understanding the student's expectations and desires is critical.

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