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**Policy Paper on Curriculum Audit**

**Performance Assessment and Quality Control:  
A Continuous Need for Professional Education  
in Developing Countries**

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"Take your Universities. What have they done during the fifty years of their existences. They have not produced one original man. They are merely an examining body."

*Vivekananda*

## **ABSTRACT**

For last three decades the volumes of exports and foreign direct investment (FDI) have been growing faster than ever. The basis of this growth is knowledge-driven competition. The prime motive forces behind this growth are drastically changing conditions and contexts in which knowledge accumulates and applies to the modern world. It is argued that the problem of knowledge lies at the heart of economic analysis the market system has developed solutions to two intertwined problems. The first is the very nature of knowledge and its distribution among all the agents in an economic system and the inability of one to acquire the total knowledge of what different individuals want. The market system appears to solve this problem. The other related problem is that of the increasing growth rate of accumulation of knowledge. The market system is a framework for testing business hypothesis and adapting to new events with new knowledge. The consequence of this kind of trial and error method in the competition process is economic development in form of innovation. Successful innovation leading to emergence of new products or processes can capture a greater market share. Thus market system in essence is a development system, which works as generator of new knowledge. If the goal of professional/vocational education is to produce leaders of modern knowledge-driven industries, then the professional education process should imbibe the process of knowledge generation and advancement. Such a process being continuous, professional education industry should continuously monitor the knowledge input in the intermediate stages of the production process. UNESCO has started developing the model of quality management in education in 1995. So far UNESCO's Initial Educational Policy Research Project has worked on primary education covering seven countries. One can explore the possibility as well as the modus operandi of quality management in higher studies like post graduate professional education programmes. Here the policy of quality control in professional education can offer the necessary standard of managerial skill, which can give a boost to the country's competitiveness in an increasingly competitive environment of international trade. Again quality control policy has two components - performance assessment in every stage and total quality management. Finally, a professional institution can apply for Quality Management Systems Certification Scheme of Bureau of Indian Standards, the Indian counterpart of Malcolm Baldrige National Quality Award Scheme under the US Department of Commerce.

1. Introduction
2. The issues
3. Analysis of the issues
4. A case study of quality control through performance assessment
5. Conclusion

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## **1. Introduction – the backdrop**

For last three decades the volumes of exports and foreign direct investment (FDI) have been growing faster than ever. The basis of this growth is knowledge-driven competition. The prime motive forces behind this growth are drastically changing conditions and contexts in which knowledge accumulates and applies to the modern world. It is argued that the problem of knowledge lies at the heart of economic analysis the market system has developed solutions to two intertwined problems.

The first is the very nature of knowledge and its distribution among all the agents in an economic system and the inability of one to acquire the total knowledge of what different individuals want. The market system appears to solve this problem.

The other related problem is that of the increasing growth rate of accumulation of knowledge. The market system is a framework for testing business hypothesis and adapting to new events with new knowledge. The consequence of this kind of trial and error method in the competition process is economic development in form of innovation. Successful innovation leading to emergence of new products or processes can capture a greater market share.

Thus market system in essence is a development system, which works as generator of new knowledge. If the goal of professional/vocational education is to produce leaders of modern knowledge-driven industries, then the professional education process should imbibe the process of knowledge generation and advancement. Such a process being continuous, professional education industry should continuously monitor the knowledge input in the intermediate stages of the production process. UNESCO has started developing the model of quality management in education in 1995. So far UNESCO's Initial Educational Policy Research Project has worked on primary education covering seven countries. One can explore the possibility as well as the modus operandi of quality management in higher studies like post graduate professional education programmes.

## **2. The issues**

(a) Whether professional education can be termed a production process

- (b) Whether a final year student of a professional education programme (henceforth ‘a professional student’) can be termed ‘product’
- (c) Whether the concept of quality applies to such product
- (d) Whether the concept of quality control applies to such product
- (e) What are the inputs and outputs at various stages of transformation from non-human resource to human resource?
- (f) Exactly where the need for quality control in professional education lies, if any in the context of India.
- (g) Quality control through performance assessment – development of theory and practice
- (h) Quality control through performance assessment – policy analysis for professional education

### **3. Analysis of the issues**

#### **(a) Whether professional education can be termed a production process**

‘Production’ means the use of resources to make goods and services, which have economic value<sup>i</sup>. The expression ‘means of production, distribution and exchange’ seeks to divide economic activity into changing the physical form of things, changing their location and changing their ownership. In economic sense however it is not clear how such a classification apply to services. ‘Production’ also means the cost units manufactured by an organization<sup>ii</sup>. One of the meanings of ‘manufacture’ is to produce substance and one of the meanings of ‘produce’ is to create with skill<sup>iii</sup>. ‘Substance’ means a type of solid, liquid or gas that has particular qualities. When ‘produce substance’ means ‘create substance with skill’, the term ‘substance’ means something more than a type of solid, liquid or gas with particular qualities<sup>iv</sup>. The meaning of ‘human capital’ indicates that the ‘substance’ here is human capital<sup>v</sup>. ‘Service’ means good consisting of labor, advice, managerial skill etc rather than a commodity<sup>vi</sup>. ‘Service’ also means economic goods that are not in tangible or storable form and in some cases require physical presence of the customer<sup>vii</sup>. Thus professional education is indeed a production process.

#### **(b) Whether a final year professional student can be termed ‘product’.**

‘Product’ means anything that can be offered to the market for attention, acquisition use or consumption that might satisfy a need<sup>viii</sup>. It includes physical objects and services. The meaning of ‘human capital’ is the skills general or specific acquired by an individual in the course of work and experience<sup>ix</sup>. The concept was introduced by Gary Becker in the 1960s in order to point out that wages reflect in part a return on human capital. This theory is used to explain large variations in wages for apparently similar jobs and why even in a recession a firm may retain its workers on relatively high wages in spite of involuntary unemployment. A final year student equipped with managerial skill and training is therefore at the same time human capital and skilled labor. This means skilled labor is the product of professional/vocational education. In the same tune a professional student - fresher or in an intermediate stage can be called human non-capital. Thus a final year professional student is a product of professional education.

**(c) Whether the concept of quality applies to such product.**

‘Quality’ means standard, with which to compare<sup>x</sup>. ‘Quality’ also means the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs<sup>xi</sup>. When one applies the combination of these meanings to a final year professional student, quality of the product of professional education comes out to be his standard, ability and skill as described by the producer, i.e. the institution of professional education which can satisfy the stated or implied needs of corporate employers. Thus the concept of quality applies to the final year vocational student because he has to satisfy his employer. In a different way Prema (2004) has spelt the same in the context of teachers’ education<sup>xii</sup>.

**(d) Whether the concept of quality control applies to such product**

‘Quality control’ means the practice of checking goods as they are being produced, to make sure that they are of a high standard<sup>xiii</sup>. Here ‘goods’ do not mean services<sup>xiv</sup>. ‘Quality control’ also means the system for checking the quality of a ‘product’ and ‘product’ means ‘what is produced by an individual firm, an industry or the economy’ and thus includes services<sup>xv</sup>. Again ‘good’ means a commodity or service that is regarded by economists as satisfying a human need and ‘quality control’ means the activities and techniques used to achieve and maintain a high standard of quality in a transformation process<sup>xvi</sup>. They may include systematic inspection of inputs and outputs at various stages



in their transformation to ensure that acceptable tolerances are not being exceeded. They may also involve statistical analysis of the data about production collected by appropriate sampling techniques; in this case the costs incurred need be balanced against the customer's goodwill. Quality control is also concerned with finding and eliminating the causes of quality problems. Thus quality control is applicable to the product of professional education.

**(e) What are the inputs and outputs at various stages of transformation from non-human capital to human non-capital?**

'Input' means 'time, knowledge, ideas, etc. that one puts into work, a project, etc. in order to make it succeed'<sup>xvii</sup>. This meaning of input applies to professional education<sup>xviii</sup>. 'Output' means the amount of something that a person, a machine or an organization produces<sup>xix</sup>. 'Output' also means the result of an economic process available for sale or use elsewhere<sup>xx</sup>. Combining these meanings output at every stage of production means input for the next stage. Applying the idea to a vocational student output at every stage means his performance in every trimester and input means the modules of different curricula he has imbibed during the trimester<sup>xxi</sup>.

**(f) Exactly where the need for quality control in professional education lies, if any in the context of India.**

The need for quality control in professional education lies in the resolution of the issue of competitiveness of India in international trade vis-à-vis the competing economies like China. The concept of competitiveness when applied to firms in a particular industry or subindustry, means the ability to produce lower-cost-and-higher-quality commodity vis-à-vis the rivals. It is defined implicitly in terms of a country's trade balance. A country with more competitive firms enjoys a higher trade balance and vice-versa. A competitive nation is defined to be one that can succeed in international trade via technology and productivity with accompanying high income and wages. A nation with high labor productivity and high total factor productivity (TFP) is defined to be internationally competitive with high incomes and a high standard of living<sup>xxii</sup>. Wignaraja (2003) enunciates three distinct views on competitiveness:

- (a) a macroeconomic perspective which deals with internal and external balance at country-level and focuses on real exchange rate management as the principal tool for competitiveness;
- (b) a business strategy perspective which is concerned with rivalries between firms and countries and a limited role for public policies in fostering competitiveness;
- (c) a technology and innovation perspective that emphasizes innovation and learning at the enterprise and national levels and active public policies for creating competitiveness<sup>xxiii</sup>

Managers, who are responsible for domestic and worldwide business, gear the second approach for the analysis of decision-making. Competition from new entrants and existing firms within industries provide rationale for business strategy at firm level e.g. to set goals, forecast the industry environment and plan resource deployments. This approach has responded to this dynamic need by proposing a variety of generic strategies for enterprise to maintain or increase market in an industry and maximize profits.

A well-managed competitive strategy is clearly necessary but not sufficient condition for industrial success in the developing world through international trade. The success depends on three groups of factor-conditions:

- (a) The first group relates to external shocks like sudden fall in world demand, a rise in world interest rates or an international financial crisis.
- (b) The second group relates to country size, population size, climatic conditions, geographical locations and resource base.
- (c) The third group relates to political stability, macroeconomic governance, government capabilities, government commitment and the relationship between the government and the private sector.

The second group relates to quality of professional education. Poverty or richness of managerial skill lies in this group. A skill-poor country may find fewer options for industrial development and scant FDI flows to its industries managed poorly because of want of managerial skill. Furthermore, quality of goods of services produced or offered by an organization or country is the most important component of its competitiveness vis-à-vis the rivals. Other components are reliability, delivery and price.

Further, the product manufactured by an institution of professional education should satisfy the human resource needs of the country especially the industry. Prema (2000) has

stressed on the relationship between curricular studies and job requirements, but she has not described how development and administration of curricula can be linked to job requirements.

**(g) Quality control through performance assessment – development of theory and practice**

As per item (e), quality control in professional education amounts to performance assessment in every stage. The idea of setting work standards and wage incentive introduced by Fredrick Taylor in 1911 nowadays applies to professional education in forms of study and research standards and grade incentives. An outgrowth of Taylor's principles was establishment of quality inspection departments, which worked as policeman to see that engineering specifications are met. Good professional education institutes can do the same by conducting quality audit programs. In such programs one can be examine how much of original standards or goals are achieved by each module of a curriculum and during the session of administering the curriculum. If the divergence between the originally set standards and actually achieved standards can be quantified in terms of the difference between the numbers of originally set standards and achieved standards for each student, then it may be feasible in practice to define an interval within which the average achievement of a class should vary.

Walter Shewart a physicist at Bell Telephone Laboratories demonstrated that through analysis of each stage, the manufacturing personnel could easily recognize the errors and make necessary adjustments. This prevents poor quality from being produced and virtually costs nothing. Shewart has shown a direct connection between the costs of producing high quality and the variability in process output. Variability in process output makes inspection necessary. Applying to professional education, process output means what the student becomes at the end of a trimester. His absorption of input during a trimester is a process. Variation in process output means the deviation of what the student learns from what the curriculum aims to teach, or, to be more specific what a particular module aims to teach.

During the outbreak of World War II, W. Edwards Deming a follower of Shewart categorized the causes of variability in process output into common causes and special causes. He found common causes are responsible for 85% of variation. By 'common

causes' he implied circumstances and environment, like poor lighting in the plant and by 'special causes' he implied those, which happen occasionally like breakdown of machinery. He found management overlook common causes and blame special causes<sup>xxiv</sup>. Applying Deming's idea to the divergence between the set standard and the actual standard as reflected by a student's performance can be assigned to the common causes like his spontaneous/natural habit to devote less priority to curricular activities than extra curricular activities and the special causes like poor communication ability of the teacher or a fear or trauma about the subject. The common causes in this case may be left for rectification to a mentor (e.g. his hostel superintendent may play this role) and the special cause to the teacher or a committee of teachers like academic support committees. Japanese companies started adopting quality control models of Schewart and Deming. The result was that Japanese products became world's standard of quality. US ignored Deming till 1980. Since 1980 United States and other industrial countries became aware of what Japan calls Company Wide Quality Control (CWQC) and US calls total quality management (TQM).

#### **(h) Quality control through performance assessment – policy analysis for professional education**

There are five paradigms that guide TQM:

- (a) Pleasing customers is the first and foremost priority and driver for all business activities. Continuous improvement in the area is necessary for prosperity of the firm. Applying to professional education, this implies pleasing internal as well as external customers. The professional education institution produces and sells education and training services to the students, the internal customers on the one hand and on the other hand produces and offers managerial skills to industries, the external customers.
- (b) Most of the problems in pleasing customers are system problems and not the error of individual problems. In professional education, system problems may be loopholes in rules and regulations associated with hostel, examination, admission, library, placement etc. Again the rules and regulations are decided collectively. Herein lies the necessity of the next paradigm.
- (c) Cooperation, teamwork and synergy involving all individuals with some system awareness/knowledge is the best way to solve system problems.

(d) Scientific methods and statistical facts/data rather than baseless and arbitrary opinions should be the basis for all decision-making at all levels. Statistical database and control charts can be communication tools to foster teamwork and cooperation in developing solution to system problems. This means in a professional education institution every body should know the necessary statistical tools. Moreover analyzing the performance records of a batch of students for a reasonably long period (e.g. five years) needs knowledge of statistics. Otherwise a teacher won't be able to gauge the scale and dimension of his teaching in the long run. After all quality, competitiveness and skill of a professional course teacher should increase over time.

(e) Because of points (a) and (b) TQM is necessarily a management system based on mutual trust, respect and cooperation between the individuals junior and senior. When applied to any professional education institution this means mutual trust, respect and cooperation among faculty, among staff and between the two.

The need and benefit for professional education institutions adopting the TQM philosophy is threefold. First it is necessary for survival in today's competitive environment. Second it would reduce waste and save public money. Finally, it is a moral thing to do. Customers get better service and product at a lower cost, jobs are preserved and employees are treated with dignity and find more job satisfaction<sup>xxv</sup>. A professional course teacher offering a quality course faces increasing demand on him as also his course.

#### **4. A case of quality control through performance assessment**

As a Nodal Officer of the statistical cell of a university to carry out the task of collection, compilation and maintenance of all data in respect of the university I have got the opportunity of conducting the program of quality control through performance assessment (PQCPA).

The university runs three years MBA programme in six Semesters. Each semester has six courses. Currently summer semester is closing. The summer semester observes second, fourth and sixth Semesters. The steps of the quality control exercise are laid down below:

(1) The standard of a course is defined in terms of the objectives mentioned in the beginning of the curriculum.

(2) In the end of the semester every student is asked how many objectives are achieved she thinks. Summing up these numbers for all students and then dividing the aggregate by the total number of students taking the course gives the average number of objectives achieved per student. The difference between the A and B as a percentage of A is taken as a measure of deviation from the standard received by the student.

(3) Feedback is also taken from each course teacher, regarding how many objectives she has achieved. The difference between A and C as a percentage of A is taken as a measure of deviation from the standard served by the course teacher.

The sum of (2) and (3) together is taken a measure of deviation from the standard of input.

(5) Finally feedback is taken from each student regarding how much weight she thinks the course teacher has given to different components of examination like memory test, application ability test, reasoning test and judgment formulation test. Comparing the students feedbacks with the weights originally given assigned to each component of examination in the curriculum, it is calculated how many students do not agree with weight given in the curriculum by the course teacher to a particular component of examination. The exercise is carried out for all the components of examination and for each course. The number of students not agreeing as a percentage of the total number of students in a course is taken as a measure of deviation from the standard of output.

(6) The measure of total deviation from standard is obtained as the sum of deviation from input standard plus deviation from output standard i.e. (3) + (4) + (5) for each course. This exercise is accomplished for all courses. Then courses are ranked. The less the total deviation the better the performance and the higher is the rank. Rank is taken as a measure of the performance of course. The table is given in the annexure.

(7) After the above exercise, the course teachers are administered faculty-orientation program, where the reasons behind the deviations are detected and analyzed; means and ways of improvement are adopted and accommodated in the curricula of the next semester.

## **5. Conclusion**

Thus the policy of quality control in professional education can offer the necessary standard of managerial skill, which can give a boost to the country's competitiveness in

an increasingly competitive environment of international trade. Again quality control policy has two components:

- (a) Performance assessment in every stage
- (b) Total quality management

Finally, a professional institution can apply for Quality Management Systems Certification Scheme of Bureau of Indian Standards, the Indian counterpart of Malcolm Baldrige National Quality Award Scheme under the US Department of Commerce.

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## Annexure

### Description of columns

A: Each element in this column denotes difference between the number of objectives laid down in the curriculum and the number of objectives achieved as a percentage of the former as perceived by the students of the particular course

B: Each element in this column denotes difference between the number of objectives laid down in the curriculum and the number of objectives achieved as a percentage of the former as perceived by the teacher of the particular course

C: Each element in this column denotes average of the percentages of all the students not agreeing with the weights the teacher has given to different components of examination

D: Each element in this column denotes the average of the corresponding elements in the columns A, B and C. The tables below are purely representative. For reasons of confidentiality the name of the university and actual tables are not given.

E: The course

F: The semester

G: The rank of the course

<b>Performance Table of Summer Semester for the Department of Economics, December 2004-April 2005</b>						
A	B	C	D	E	F	G
50	0	95.8	48.6	Macroeconomics	Semester 2	1
65	0	100	55	Public Finance	Semester 4	2
70	60	74.3	68.1	International Economics	Semester 4	3
66	60	80.9	69	Law and Economics	Semester 6	4
69.6	60	82.8	70.8	Microeconomics	Semester 2	5
72.5	50	95	72.5	Econometrics	Semester 2	6

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### Notes

<sup>i</sup> Black J (2002): *Oxford Dictionary of Economics*, Oxford, 2<sup>nd</sup> Edition

<sup>ii</sup> Pallister J and Issacs A ed. (2003): *Oxford Dictionary of Business*, Oxford, 4<sup>th</sup> Edition

<sup>iii</sup> Hornby A. S (2000): *Oxford Advanced Learner's Dictionary*, Oxford, 6<sup>th</sup> Edition

<sup>iv</sup> Id

<sup>v</sup> Supra no 2

<sup>vi</sup> Butler B, Butler D and Issacs A ed. (1997): *Oxford Dictionary of Banking and Finance*, 2<sup>nd</sup> Edition

<sup>vii</sup> Supra no 1

<sup>viii</sup> Supra no 2

<sup>ix</sup> Id

<sup>x</sup> Supra no 3

<sup>xi</sup> Supra no 2

<sup>xii</sup> Prema P (2004): "Quality Assurance in the Professional Teaching of Teacher Educators: Challenges and Strategies", *University News*, AIU, New Delhi, Volume 42, No 32

<sup>xiii</sup> Supra no 3

<sup>xiv</sup> Same is true for Oxford Dictionary of Economics (2002).

<sup>xv</sup> Supra no 1

<sup>xvi</sup> Supra no 2

<sup>xvii</sup> Supra no 3

<sup>xviii</sup> But the meaning given by Oxford Dictionary of Economics (2002) does not apply to the same.



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<sup>xix</sup> Supra no 3

<sup>xx</sup> Supra no 1

<sup>xxi</sup> The curriculum is the educative process in the real sense. Its design, construction and operation constitute the crux of the teacher's work. It is everything that students and teachers do. It has two parts – (a) activities and (b) materials.

(a) Activities: Activities include the work of class committees and student councils, the carrying on of newspapers, magazines and “annuals” the sports and plays, researches, excursions, the reading and study, dramatization, the aesthetic appreciation and the creative expression, as well as practice of innumerable techniques.

(b) Materials: Materials include books, lectures, physical equipments of laboratory and classroom and the vast range of other materials engaged in the activities.

More is available in Connel W. F, Debus R. L and Niblett W. R ed. (1967): *Readings in The Foundations of Education*, Routledge, London

<sup>xxii</sup> Dollar D and Wolff E. N (1993): *Competitiveness, Convergence and International Specialization*, The MIT Press, Cambridge, pp 1-3

Labor productivity indicates the extent to which a nation can maintain low cost production despite higher wages. TFP measures output manufactured by a given amounts of labor and capital together.

<sup>xxiii</sup> Wignaraja G (2003): “Competitive analysis and strategy” in Wignaraja G. ed. (2003): *Competitive Strategy in Developing Countries – A manual for policy analysis*, Ch 2

<sup>xxiv</sup> Erjavec L (2001): *Modern Statistics for Engineering and Quality Management*, Thomson and Duxbury, Australia

<sup>xxv</sup> Oakland J. S (1993): *Total Quality Management*, Butterworth Heinmann, Jordan Hill, 2<sup>nd</sup> Edition