Total Quality Management and Research Productivity - A Case Report

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Abstract

Total Quality Management (TQM) has been explored in several areas in the past. However, the report on TQM in allied health sciences is yet to come. The present report highlights the TQM approach adopted and the consequential benefits derived by an allied health institution with focus on research productivity. The TQM approach was styled in terms of the "four pillars of TQM" viz., synergistic relationships, commitment to continuous improvement, system approach and commitment of top management. As part of the TQM approach, the institute strategized to implement ISO 9001:2008 alongside the Internal Quality Assurance Cell (IQAC). The dataset comprised of 436 scientific publications and 509 scientific presentations spanning a period of 6 years from 2010-11 to 2015-16. The results indicated an increase in people involvement in terms of student participation, faculty participation, faculty-student collaboration and faculty collaboration in respect of scientific publications and scientific presentations. The per-capita faculty productivity also increased by 24% in scientific publications and 36% in respect of scientific presentations. The present study also brings into perspective, the advantages of people involvement, people development and the importance of local collaboration in research.

Keywords: Allied Health, People Involvement, Per-Capita Faculty Productivity, Research Productivity, Total Quality Management

1. Introduction

Quality is the mantra of every enterprise which aspires to be on the cutting edge. Organizations have taken up quality management systems world over to strengthen their competitive advantage and in their march towards excellence. Despite a tendency to associate quality systems to manufacturing set-ups, the quality jargons have become all pervasive and have transcended every sphere of activity.

The term "Total Quality Management" (TQM) is understood and perceived in many ways and therefore, a good number of definitions of TQM gets available in the literature with different connotations[15]. Goetsch and Davis[7] believed that "TQM consists of relentless improvement activities, involving everybody in the business in a totally integrated effort towards improving performance at every level. "Schargel[10] opined that "TQM uses employee capabilities in all activities and processes and makes collaboration feasible and real." Gaither[6] held the view that "TQM is the process of changing the basic culture of an organisation and redirecting it towards superior product or service quality. "British Standard Institution [BS 7850-1:1992] define TQM as "A management philosophy and company practices that aim to harness the human and material resources of an organization in the most effective way to achieve the objectives of the organization"[3]. Yusuf and Aspinwall[14] state that "TQM helps in creating a culture of trust, participation, team-work, quality-mindedness, enthusiasm for continuous improvement, constant learning and as a result, a working culture that contributes towards a firm's success and existence". To suffice, TQM is a management approach, a philosophy, an organizational ethos and culture that aims at establish-

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ing the right quality ecosystem through partnerships, collaborative work and active participation of all interested parties, bringing within its scope, all activities of an organisation, through a systematic process of continual improvement. TQM is strategic, has a long-term perspectiveand has people involvement and people development at the heart of its approach. TQM also adopts a systems approach, appreciates the interdependence of different parts of an organisation and also its environment and is holistic.

As Bonstingl[2], put it, "TQM aims at bringing out the best qualities in ourselves, in others and in the work, we do together. It is, in many ways, a natural fit with the hopes and aspirations of educational leaders in their work to improve schools and communities. Productivity goes up, as work processes are improved continuously. Educational organizations are recreating their work processes, interactions, mission statements and long-term vision and strategies". There are several quality management programs such as continuous quality improvement; quality consistency; participation of academics, students and non-academic staff; satisfaction of the clients; and the existence of management procedures that reinforce quality[13] that are relevant in the context of higher education. Dobyns and Crawford-Mason[4] held the view that whatever the determining incentive, where quality management has been implemented in education, it has made an enormous difference as mentioned. Quality can create an ambience where educationalists, parents, government officials, community representatives and business leaders work jointly to deliver students with the resources they need to meet current and future academic, business and societal needs[1].

The applicability of TQM in Higher Education Institutions (HEIs) is articulated to be relevant, appropriate and compatible and is a way of achieving and maintaining excellence in higher education[8,5,9,11,12] and "HEIs are inclined to espouse TQM into their process in order to enjoy its benefits"[15.] TQMs, in the past, have been explored in several areas. However, the report on TQM in allied health sciences is yet to come. The current case report presents the Total Quality Management and research productivity in an allied health science institution, which has four verticals - academic, research, clinical services and public education in the field of communication disorders.

2. Case Report

The All India Institute of Speech and Hearing (AIISH) was established in the year 1966, fully funded by the Ministry of Health and Family Welfare, Government of India and is a premier institute offering academic programmes related to communication disorders. The major objectives of the institute are man power generation, conducting research, rendering clinical services and educating the public on issues related to communication disorders. The range of academic programmes offered by AIISH vary between diplomas to post-doctoral fellowship. Situated in a lush green campus of 30 acres adjacent to the University of Mysore in Manasagangothri, Mysuru, Karnataka, it is a unique institute in the Asian sub-continent.

The institute was awarded the highest grade of 'A' by the National Assessment and Accreditation Council (NAAC) with a CGPA of 3.35. The NAAC Peer Team had made a specific observation during the exit meeting that the institute had great research potential and that its current research accomplishments, despite being the best among the institutions in the field of speech and hearing in the country, does not commensurate with the intellectual capital available in the institute. Triggered by this observation and to ensure that research productivity happens not by default, but by design via plans and by harnessing partnerships, the institute embarked on a TQM approach and strategized to implement ISO 9001:2008 QMS alongside the Internal Quality Assurance Cell (IQAC) of NAAC as part of a TQM approach.

The institute established an ISO implementation cell, which developed the documentation relating to the quality manuals, quality system procedures and departmental manuals in consultation with the user departments and sections. The Heads of the departments and sections were associated in the coining of the Vision and Mission statements, the institutional and departmental objectives. The ISO implementation Cell also organised orientation and awareness programmes on ISO 9001:2008 to ensure organisation-wide involvement. Training programmes were also conducted to educate internal auditors for effective sustenance of the implementation of ISO in the organization. Measures of performances were clearly defined in terms of quantifiable deliverables, which were constantly monitored and reviewed. The present report highlights the TQM approach adopted by the institute and the consequential benefits derived with focus on research productivity.

3. Method

The TQM approach was styled in terms of the "Four pillars of TQM" as outlined by John Jay Bonstingl (1992) with focus on (1) Synergistic relationships, (2) Commitment to Continuous Improvement, (3) Systems approach and (4) Commitment of Top Management. Gap analyses were done with a view to address and strengthen the four pillars of TQM. Individual strategies covering the four pillars were drawn. The individual strategies also had a spill-over effect, positively influencing the other pillars and contributed to the overall research productivity of the organization both in terms of quality and quantity. The strategies adopted under each of the focus areas are discussed briefly in the paragraphs that follow:

3.1 Synergistic Relationships

One of the cornerstones of TQM is "People Involvement" and the two main players in knowledge generation in a HEI are the faculty and the students. As such, there were activities like the scientific journal clubs and clinical conferences guided by faculty. The strategy included harnessing of partnerships between the faculty and student as well as inter-faculty partnerships in the realm of scientific presentations and scientific publications. Faculty partnered with the students and guided them in scientific presentations and scientific publications. Inter disciplinary collaborations were given thrust and annual targets were set for individual faculty in respect of scientific publications and scientific presentations. Partnerships between faculty and clinical staff were also encouraged.

3.2 Commitment to Continuous Improvement

The strategy towards continuous improvement had its focus on "People Development" which is another significant hallmark of TQM. The strategy focussed on enhancing the capabilities of the students and faculty in research activities and covered aspects relating to curricular design, research training and mentoring, besides increasing awareness and conducting of training on best practices. Workshops on academic writing, on application of statistical software for data analysis were conducted and invited talks on research design were organised. The curriculum design and evaluation methods were revised so as to include student presentations and assignments that aimed at developing original thinking among the students. Videos on team work, time management, leadership and productivity were played during departmental peer evaluation meetings.

3.3 Systems Approach

People and Process integration was the core of the strategy in establishing the systems approach. Quality initiatives permeated and touched all processes including the support processes. The library and information centre expanded its range of services to include digital repository, making available remote access to the electronic and online information resources, enhanced subscription to e-journals and e-books, besides extending additional services like end-notes, anti-plagiarism services such as turn-it-in software. To promote timeliness and transparency in the procurement process, "e-procurement" methods were adopted by the institute. Improvement in support services to extra mural grants was another step in this direction.

3.4 Commitment of Top Management

The commitment of top management was reflected by the leadership through initiation of a slew of quality initiatives, formulation of the quality policy, vision and mission statements and through active participation in the management review meetings. Annual quality plans were drawn, monitored and reviewed. Monthly review meetings at the director level and weekly meetings at the departmental level helped to review the attainments of goals under the different verticals. Departmental Peer Evaluation meetings were introduced with faculty attendance made compulsory to these meetings. These meetings provided a glimpse of each of the individual department's activities under all its verticals, serving as a platform for inter-disciplinary initiatives, besides stifling healthy competition. In so far as the quality initiatives involving research activities, the Director brought out a compendium of research containing articles from the various research projects granted by the AIISH Research Fund. Awareness sessions on Intellectual Property Rights were organised and emphasis was given to product development. Training was also organised on patent filing. The students were sensitized on the importance of ethics in research and anti-plagiarism reports were insisted upon in student submissions which involved original and creative thinking.

3.5 Metrics

With a view to assess the effect of TQM on the research productivity, the quality metrics included the following:

3.5.1 People Involvement Metrics

People involvement metrics was reckoned in terms of 1. Number of student participations, 2. Number of faculty participations, 3. Number of faculty-student collaborations, 4. Number of faculty-faculty collaborations and 5. Department wise consistency (no. of productive years during the 3 years period) were incorporated.

3.5.2 Productivity Metrics

Per-capita faculty productivity, Cumulative productivity (in terms of total numbers) and Cumulative productivity (in terms of score) were included under this. A score of 5 was given for international publications/international conferences and score of 3 was given for national publications/national conferences.

3.6 Data Set

The information on national and international publications and on national and international conferences as contained in the annual reports of the All India Institute of Speech and Hearing, Mysore, for the period 2010-11 to 2015-16 formed the basic data for this study. The dataset comprised of 436 scientific publications and 509 scientific presenta-tions spanning a period of 6 years from 2010-11 to 2015-16. As the IQAC and ISO initiatives started in the year 2013-14, the period of three years from 2010-11 to 2012-13 and the period of three years from 2013-14 to 2015-16 were taken to represent the pre- and post-TQM implementation years.

4. Results and Discussion

The results indicated an increase in people involvement and productivity during the post-TQM implementation in scientific publications and scientific presentations. In terms of people involvement, the increase in student participation, faculty participation, faculty-student collaboration and faculty-faculty collaboration were respectively 35%, 59%, 63% and 142% in respect of scientific publications. Further, the increase in productivity metrics in terms of per-capita faculty productivity, cumulative productivity (nos.) cumulative productivity (score) were respectively 24%, 73% and 94% with respect to scientific publications. Similar trend was observed in scientific presentations, which registered an increase in student participation, faculty participation, faculty-student collaboration and faculty-faculty collaboration by 59%, 29%, 1%, 122% respectively. The increase in productivity metrics in terms of per-capita faculty productivity, cumulative productivity (nos.) cumulative productivity (score) were respectively 36%, 81% and 77% in respect of scientific presentations. Table 1A and 1B summarises the people involvement and productivity data, pre- and

Table 1A: Summary of the people involvement and productivity data: Pre- and Post-TQM implementation with respect to scientific publications

People Involvement Metrics				Productivity Metrics			
Quality Dimension	2010-11 to 2012-13	2013-14 to 2015-16	% increase	Quality Dimension	2010-11 to 2012-13	2013-14 to 2015-16	% increase
No. of student participation	130	175	34.68	Per-capita faculty productivity	7.99	9.90	23.90
No. of faculty participation	68	108	58.82	Cumulative productivity (in nos.)	160 (129 N + 31 I)	276 (165 N + 111 I)	72.50
No. of faculty-student collaboration	115	188	63.48	Cumulative productivity (in score)	542 (129 * 3 + 31 * 5)	1050 (165 * 3 + 111 * 5)	93.73
No. of faculty-faculty collaboration	50	121	142.00	N: Publications in National Journals I : Publications in International Journals			

Table 1B: Summary of the people involvement and productivity data: Pre- and post-TQM implementation with respect to scientific presentations

People Involvement Metrics				Productivity Metrics			
Quality Dimension	2010-11 to 2012-13	2013-14 to 2015-16	% increase	Quality Dimension	2010-11 to 2012-13	2013-14 to 2015-16	% increase
No. of student participation	153	244	59.48	Per-capita faculty productivity	8.36	11.37	36.00
No. of faculty participation	79	102	29.11	Cumulative productivity (in nos.)	181 (123 N + 58 I)	328 (236 N + 92 I)	81.22
No. of faculty-student collaboration	130	131	0.77	Cumulative productivity (in score)	659 (123 * 3 + 58 * 5)	1168 (236 * 3 + 92 * 5)	77.24
No. of faculty-faculty collaboration	46	102	121.74	N: Presentations in National conferences I : Presentations in International conferences			

post-TQM implementation with respect to scientific publications and scientific presentations.

In addition, the departments increased their consistency in the post-TQM implementation with respect to scientific publications and presentations which are presented in Tables 2A and 2B.

5. People-Involvement Metrics

5.1 Number of Participations

The increase in the number of student participation was highest in scientific presentations (59%) compared to scientific publications (35%). On the other hand, the increase in the number of faculty participation was highest in scientific publications (59%) compared to scientific presentations (29%).

5.2 Number of Collaborations

The number of collaborations between faculty-student as well as faculty-faculty also registered an increase post implementation of TQM under both the forms of research productivity, viz. scientific publications and scientific presentations. The increase in the number of faculty-student collaboration was highest in scientific publications (63%) compared to scientific presentations (0.77%). The increase in the number of faculty-faculty collaboration was also highest in scientific publications (142%) compared to scientific presentations (122%).

Table 2A: Department-wise consistency pattern: Pre- and post-TQM implementation with respect to scientific publications

Departments / Period	AUD	SLP	SLS	DCS	Sp.Ed.	Cli. Psy	ENT	Electronics
2010-11 to 2012-13	3/3	3/3	3/3	3/3	2/3	3/3	1/3	1/3
2013-14 to 2015-16	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3

Table 2B: Department-wise consistency pattern: Pre- and post-TQM implementation with respect to scientific presentations

Departments / Period	AUD	SLP	SLS	DCS	Sp.Ed.	Cli. Psy	ENT	Electronics
2010-11 to 2012-13	3/3	3/3	3/3	3/3	1/3	2/3	1/3	1/3
2013-14 to 2015-16	3/3	3/3	3/3	3/3	2/3	3/3	0/3	3/3

AUD: Audiology; SLP: Speech-Language Pathology; SLS: Speech-language Sciences; DCS: Department of Clinical Services; Sp.Ed.: Special-Education; Cli.Psy.: Clinical Psychology

5.3 Department-wise Consistency Pattern

The department-wise consistency pattern was calculated in terms of the number of years the departments were consistent during the period of three years. This pattern also revealed interesting results. While four of the departments maintained its consistency of 3/3 in both pre- and post-TQM implementation period, four other departments which had a lesser consistency during the pre-TQM implementation, improved its consistency to 3/3 post-TQM implementation period in scientific publications. Similar trend was observed in respect of scientific presentations. Four of the departments maintained its consistency of 3/3 in both pre-and post-TQM implementation period. Three other departments which had a lesser consistency during the pre-TQM implementation, improved its consistency to 3/3 post-TQM implementation. No impact of TQM implementation was observed in respect of one of the departments. Notwithstanding, it could be observed that consistency by the departments was sustained and increase in consistency was witnessed post-implementation of TQM in scientific publications and scientific presentations. The finding as above in terms of increased participation and increased consistency, in turn leading to increased collaborations affirms that TQM is relevant to HEIs and uses capabilities of the team members to make collaborations feasible and real resulting in a culture of team work.

6. Productivity Metrics

6.1 Per-Capita Faculty Productivity

The per-capita faculty productivity saw an enhancement post implementation of TQM in scientific publications and scientific presentations. The increase in the per-capita faculty productivity was highest in scientific presentations (36%) compared to increase in the per-capita faculty productivity in scientific publications (24%).

6.2 Cumulative Productivity

The increase in the cumulative productivity, quantitatively, in terms of the total numbers, post implementation of TQM was highest in scientific presentations (81%) compared to cumulative productivity in scientific publications (73%). In terms of the productivity score, which is a qualitative measure with differential scores for publications/presentations in national/international journals/conferences, the increase in the score post TQM implementation was highest in scientific publications (94%) compared to scientific presentations (77%).

One of the benefits of TQM includes enhanced productivity and the remarkable enhancement in productivity post implementation of TQM confirms that productivity goes up with TQM[2] and that TQM "makes an enormous difference"[4] and "improves performance at every level"[7], "maintaining excellence in higher education"[5]. Further, as Gaither[6] held, TQM heralds a new culture and ethos towards superior quality and performance.

7. Conclusions

A number of studies are available on the importance of TQM and Higher Education Institutions. The present study makes a modest attempt to understand the less explored area of implications of TQM in enhancing research productivity. Despite the enormous benefits that TQM can bring in, the implementation of TQM also has serious challenges, especially while introducing a new set of practices to a five decades old organisation. The implementation team had to overcome the resistance to change and the notion held by the faculty and staff that TQM is an additional administrative burden requiring extensive documentation and paper-work, producing relentless meetings. It was observed that the compliance and acceptance of quality systems improved as the faculty and staff started realising its benefits, both at the individual, departmental and the institute level after going through a full cycle of 3 years of ISO implementation. The present study also brings into perspective, the advantages of people involvement, people development, participative goal-setting and the importance of local collaboration in research. A committed leadership with active cooperation of all the faculty, staff, students and organisation-wide involvement is sure to usher spectacular results through adoption of TQM approach.

8. References

1. Arcaro J. Quality in education: An implementation handbook. Delray Beach, Florida: St. Lucie Press; 1995.
2. Bonstingl JJ. The quality revolution in education. Educational Leadership: Journal of the Department of Supervision and Curriculum Development, N.E.A. 1992 Jan; 50(3):4–9.

3. David H. Quality management essentials. Oxford, United Kingdom: Butterworth-Heinemann; ISBN 9780750667869, OCLC 72868446, retrieved 2017-11-10. 2007. p. 200.

4. Dobyns L, Crawford-Mason, C. Thinking about quality: Progress, wisdom and the deming philosophy. New York: Random House; 1994.

5. Eriksen SD. TQM and the transformation from an elite to a mass system of higher education in the UK. Quality Assurance in Education. 1995; 3:14–29. https://doi.org/10.1108/09684889510146795

6. Gaither N. Production and operations management. Cincinnati: Duxbury Press; 1996. PMCid: PMC2364474.

7. Goetsch DL, Davis S. Introduction to total quality: Quality, productivity, competitiveness. New York: Macmillian College Publishing Co; 1994. PMCid: PMC358670.

8. Helms S, Key CH. Are students more than customers in the classroom? Quality Progress. 1994; 27:97–9.

9. Koch JV, Fisher JL. Higher education and Total Quality Management. Total Quality Management. 1998; 9(8):659–68. https://doi.org/10.1080/0954412988136

10. Schargel FP. Transforming education through Total Quality Management: A practitioner's guide. Princeton: The Leadership Management Series; 1994.

11. Srivanci MB. Critical issues for TQM implementation in higher education. The TQM Magazine. 2004; 16:382–6. https://doi.org/10.1108/09544780410563293

12. Venkatraman S. A framework for implementing TQM in higher education programs. Quality Assurance in Education. 2007; 15:92–112. https://doi.org/10.1108/09684880710723052

13. Williams G. Total Quality Management in higher education: Panacea or placebo? Higher Education. 1993; 25:229–37. https://doi.org/10.1007/BF01383852

14. Yusuf SM, Aspinwall E. TQM implementation issue: Review and case study. International Journal of Operation and Production Management. 2000; 20:634–55. https://doi.org/10.1108/01443570010321595

15. Zaman AS, Anjalin U. Implementing Total Quality Management in education: Compatibility and challenges. Open Journal of Social Science. 2016; 4:207–17. https://doi.org/10.4236/jss.2016.411017