

Ali Zulqarnain, *Ph.D., CQSSBB*

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Personal Details

Gender :Male

Nationality :Pakistani

Career Objectives

Regarding **Auto Parts Manufacturers** in Pakistan;

1. Development and promotion of a Total Quality & Safety Culture with ownership.
2. Development and improvement of Quality Management Performance, competing local and global requirements/standards.
3. Integration of traditional Quality with Quality 4.0.

Career & Experience

2024 – to date: Director – Directorate of Industrial Liaison (Acting)

**2003 – to date: Assistant Professor, Department of Industrial & Manufacturing,
NED University of Engineering & Technology (NED UET), Karachi.**

Current Responsibilities:

- Teaching Ph.D., Postgraduate and Undergraduate Courses.
- Create Liaison between the Department and industries regarding Final Year Projects/ Postgraduate or ISP /Research Projects, Internships, Industrial Visits, Recruitment Drives, Seminars, Webinars, Guest Sessions or any other matter regarding industries.
- Teaching Professional Training Courses.
- Conducting Corporate Trainings.
- Consulting Industrial Projects related to Quality.
- Member Board of Studies (BoS) of Departments: Industrial & Manufacturing, Mechanical Engineering (with Specialization in Automotive Engg), Economics & Management Sciences, NED Academy.
- Member Industrial Advisory Board, Dept. of Industrial & Manufacturing.

Past Experience:

- Director Industrial Liaison-NED University (2014-2017).
- Director, University Advancement & Financial Assistant-NED UET (2014-2016).

- Project Director, Benazir Bhutto Shaheed Youth Development Program (BBSYDP).
- Focal Person, Verification of Graduate Records Prime Minister's Youth Training Scheme (PMYTS).
- Coordinator and Industrial Linkage, DICE Automotive/DICE Energy & Water, at NED University.
- Coordinator, Master of Engg. /Master of Engineering Management (MEM).
- Coordinator, Final Year Projects (FYP).
- Focal Person at NED UET for World Wind Energy Conference & Exhibition-2018 (Organized by World Wind Energy Association)

2002 – 2003, Assistant Engineer, Dawood Yamaha Limited (Taha Engineering) Responsibilities:

- In charge Special Purpose Machining (SPM) Shop.
(Designing and Machining of Dies, Molds, Jigs, Fixtures etc. on CNC Milling, CNC EDM, CNC Wire Cut Machines)
- In charge Quality Control
- ISO Coordinator

1999 – 2001, Assistant Manager, Agri Auto Industries Limited Responsibilities:

Production Engineering:

- Seeking & implementing methods to improve Productivity, Quality and Safety.
- Designing of Tools (Jigs/Fixtures) in coordination with Tool Room & Design Department.
- Technical Projects for Productivity & Quality improvement.

Production:

- **Meeting Monthly Demands** of Shock Absorber and Struts for OEM and Replacement Market through Just in Time (JIT) Cells, and different production lines including CNC Turning Centers, Grinding Lines, Buffing, Nickel/Zinc Platings, Welding Processes (TIG, MIG, Seam, Spot Welding etc.) and Tube Cutting Processes.
- **Meeting Monthly Demands** of other Products i.e Camshaft, Gears, Engine Sleeves, Gaskets etc. for OEM and Market, through CNC Turning Center, Gear Hobbing and Shaving, Honing, Lapping, Mechanical Presses, Hydraulic Presses, Pneumatic Presses, Shaving Machines, and Heat Treatment Processes

Quality & Maintenance: Deploy and Monitor Templates of Quality Tool's at the Shop Floor, Assisted in the Analysis of Patterns and

Interpretation and finally Recommendations.
Member Quality Improvement Teams, Quality Circles, 5S, Kaizen.

1998 – 1999, Trainee Engineer, CompuTech. Engineering Services
(HVAC/Pipe Designing Consultant)
▪ Involved in Designing of HVAC System.

Qualification

2023	Ph.D. (Quality Management)
2003	Master of Engineering with Specialization in Manufacturing.
1998	Bachelor of Engineering in Mechanical Engineering.

Research and Industrial Projects

A. As Supervisor or Co-Supervisor, successfully completed the following **Independent Study Research Projects (ISP)**:

1. Development of Digitized Data Acquisition Plan for Quality 4.0 (2024)
2. Measurement System Analysis (Gage R&R Study) for Column Type Coordinate Measuring Machine (Spring 2019).
3. **Minimization of Defects and Process Improvement in the Paint Shop by applying **Six Sigma DMAIC Methodology** at a Leading Automotive Manufacturer (OEM-Pak Suzuki Motor Company Limited) in Pakistan (Spring 2019).*
4. **Reduction in Defect rate through **Six Sigma Methodology** in the Automotive Industry (OEM-Ghandahara Nissan Limited) (Spring 2019).*
5. **Application and Evaluation of **Six Sigma** in the Garment Manufacturing Industry (Artistic) (Spring 2019).*
6. **Development of a Process Control System for a Textile Firm (Al-Rahim Textile Industries) (Spring 2019).*
7. **Analysis and Development of Process Control and inspection Feedback Systems through **Six Sigma Methodology** for a newly established Automotive Industry (OEM- Kia Lucky Motors Pakistan Limited) in Pakistan (Spring 2019).*
8. Improved patient safety and customer satisfaction in health care through quality tools (Spring 2019).
9. Development of the Process Control Techniques / Procedure for Continuous Improvement in Two Wheelers Department (Fall 2018).
10. **Implementing **Six Sigma Methodology** in the Automobile Industry (Hinopak Motors Limited): Defects minimization using **Six Sigma-DMAIC Approach** (Spring 2018).*
11. Investigation of Gap Analysis in SPC. (Fall 2017).
12. Parameter Optimization of Electro Discharge Machining on Aero-Space Alloys with Different Electrodes Materials. (Fall 2016).

13. **Process Control System Development* (Spring 2016).
 14. Component Reliability for Preventive Maintenance Strategy (Fall 2015).
 15. Development and implementation of Supplier Excellence Program for a Manufacturing Firm (Fall 2015).
 16. An Investigative Study on the Process Parameters Optimization of three Internal Coatings of Aluminum Collapsible Tubes (Fall 2014).
 17. **Line Percent Reduction by Improving Yarn Quality using Six Sigma Methodologies* (Fall 2014).
 18. Optimization of parameters for the plasma coating of aerospace alloys (Fall 2014).
 19. Comparative Study for MRR, Surface Roughness and Tool wear Rate for SKD11 on Die-Sinking EDM using different Electrode Materials (Spring 2014).
 20. An investigative study of Electric Discharge Machining (EDM) of dissimilar metals in parallel (side by side) arrangement. (Fall 2013).
 21. Planning, Monitoring and Controlling Techniques to accommodate inconsistencies in an E&P design consultancy. A Proactive and Research Approach. (Fall 2013)
 22. Identification of Risk Variables and conducting a Simulation to study their impacts on an Engineering Project. (Fall 2013).
 23. **Development of Lean Six Sigma Framework for Aviation Maintenance and Repair Organizations (MROs)* (Spring 2013).
 24. An investigative study of the Wear and Tool Chip contact length phenomenon in the High-Speed Turning of Two Engineering Alloys (Spring 2013).
 25. **Development of a Quality Cost Procedure for company-wide deployment of a Cost of Quality (CoQ) Model* (Spring 2013).
 26. **Improvement in Productivity of Thermoforming Process using DOE under Six Sigma Methodology* (Fall 2012).
- *Six Sigma Related ISPs*

B. As Supervisor/Co-supervisor, completed several **Final Year Desing Projects (FYDPs)** along with *Six Sigma* as under:

1. Designing of Smart HVAC System for Residential/Commercial Use, Spring 2023
2. Design of Smart Solar Power Generation System for Residential Area, Spring 2023
3. Fabrication of IoT-based Inspection System, Spring 2023
4. Development of Quality KPIs for Alternate Vehicle, Spring 2023
5. Design Of Smart Solar Power Generation System for Residential Area, Spring 2023
6. Designing Of Smart HVAC System for Residential/Commercial Use, Spring 2023
7. *Implementation of Six Sigma Methodologies to reduce rework rate in*

8. Development of a Smart Work Station 2.0, 2022
9. Development of an Automated System of Quality Assurance/Inspection for An Automotive Industry, Fall 2021
10. *Application of LEAN SIX SIGMA at Hino Assembly Line for process Improvement and Cost Benefit, Fall 2021*
11. *Development of Quality Improvement Techniques using Six Sigma Methodology in the Automotive Industry (AuVitronics Pvt. Ltd., Fall 2019.*
12. *Analysis & Development of Quality System using Quality Methodologies, for a Textile Firm (Al-Rahim Textile Industries, Fall 2019.*
13. *Productivity Improvement through Six Sigma at a Leading Automobile Industry of Pakistan (Pak Suzuki Motor Company Limited/Vehicle Final Assembly Dept, Fall 2019.*
14. *Application of Quality Management Techniques for a Production Line in the Automobile Industry (Gandhara Nissan Limited, Fall 2019.*
15. *Quality Improvement Techniques using Six Sigma Methodology for Automotive Parts Manufacturer (Mehran Commercial Enterprises, Fall 2019.*
16. *Waste Minimization and Productivity Enhancement in Apparel Manufacturing Using Lean Six Sigma (Artistic Milliners-AM 4, Fall 2019.*
17. *Productivity Improvement through Six Sigma Methodology (A-One Techniques Pvt. Ltd., Fall 2018-19).*
18. *Productivity Improvement in a Manufacturing Firm (Mehran Commercial Enterprise, Fall 2018-19).*
19. *Reduction in defects for a Textile Company (Al-Karam Textile, Fall 2018-19)*
20. *Productivity improvement through Six Sigma (Dawlance Pvt. Ltd., Fall 2018-19).*
21. *Productivity Improvement through Six Sigma Methodology (Mehran Commercial Enterprise, 2018).*
22. *Productivity Improvement through Six Sigma Methodology (Noor Engineering, 2018).*
23. *Elimination of Dents from Refrigerator Body using Six Sigma Methodologies (Dawlance Pvt. Ltd., 2018).*
24. *Reduction in Re-work Rate for 3rd Generation G-4 Gas Meter Assembly line using Six Sigma Techniques at Meter Manufacturing Plant (SSGC, 2017).*
25. *Six Sigma Applications at Dawlance (2014).*
26. *Application of Lean Six Sigma at Amreli Steels Limited (2014).*
27. *Reduction in material handling Defects (specifically those defects that leads to washing) by using Six Sigma Methodologies (Feroz1888 Mills Ltd., 2013).*
28. *Reduction Of Defects Per Unit Using six Sigma Methodology (SSGC, 2012).*

C. Six Sigma Projects as an External Supervisor:

1. *Reduction Of Defects/ Re-Work at the Paint Shop Assembly Line At Pak Suzuki, using Six Sigma Methodology (2018).*
2. *Reduction of Defects in the Weaving Shop at Artistic Fabrics (2018).*
3. *Various Six Sigma Projects completed during Workshops/Training Sessions.*

D. Consultancy Projects:

1. Six Sigma Application (Abbott Laboratories Pakistan Limited).
2. Implementation of ***Cost of Quality*** at Sui Gas Field (Pakistan Petroleum Limited).
3. Implementation of ***Six Sigma*** on the Crank Cases (Dawood Yamaha Limited).
4. Implementation of Visual Factory, and Process Improvement (Ali Brother Forging Pvt. Ltd.).
5. Metal Machining, House-keeping and overall Productivity enhancement (Shahab Engg. Pvt. Ltd.).

Research Interests

Quality:

- Quality Management
- Quality 4.0
- Six Sigma
- Statistical Process Control (SPC)
- Cost of Quality (CoQ)

Manufacturing:

- Metal Machining

Teaching and Professional Trainings

Teaching:

Ph.D.	Advanced Experimental Design
Post Graduate (Masters)	Total Quality Management Six Sigma Methodologies
Undergraduate (Bachelors)	Plant Engineering, Introduction to Probability & Statistics

Professional Trainings:

Experienced in developing business Leaders, and trained more than a thousand professionals at various platforms. Experience in in-house Corporate Training. Professional

Training Highlights include:

- Workshop conducted “Six Sigma Awareness” for Automobile OEM/Vendor, Academia, and other Industrial sectors.
- Workshop conducted (3 Full Days) on Cost of Quality (CoQ) at Feroz1888.
- Workshop conducted (3 Full Days) on Applied Six Sigma at International Industries Limited.
- Training (3 Full Days, several times) on Quality Management for Atlas Group of Companies.
- Workshop (4 Full Days, several times) on Applicative Six Sigma **Green** Belt Level.
- Workshop (2 Full Days, several times) on Cost of Quality (CoQ).
- Training (18 Hrs., several times) on “Preparation for Six Sigma **Green** Belt” at NED UET.
- Training (12 Hrs., several times) on “Certified Quality Professional (CQP)”.
- Training (3 Full Days) on Certified Quality Manager/Organizational Excellence (CQM/OE) i.e., “Quality Management Tools,” at Secretariat Army Stores & Clothing, Central Ordinance Depot, Karachi.
- Training (4 Full Days, several times) on Certified Quality Inspector (CQI) i.e “Quality Assurance,” at Secretariat Army Stores & Clothing, Central Ordinance Depot, Karachi.
- Training (3 Hrs.) on Cost of Quality at Pakistan Petroleum Limited (Sui Gas Field).
- Training (2 Full Days) on Statistical Process Control (SPC) at Hino Pak Motor Company.
- Training Session (1 Full Day) on Six Sigma Concept understanding & Application, at College of Aviation Safety Management, Pak. Air Force Masroor Base.
- Awareness Session (3 Hrs.) on TQM and its industrial needs at the Institute of Engineers Pakistan.
- Arranged various Seminars and Webinars of **Six Sigma Green** and **Yellow Belts** for Undergraduate, Postgraduate, Faculty, and Industries through the Platform of NED Scholar’s from the USA.

Experience of **Teaching** at **NUST-PNEC Karachi (Undergraduate)**, **IBA (Executive MBA/MBA, PGD Supply Chain Management/Healthcare Management, IoBM (MBA), Dow University of Health Sciences, PIQC Institute of Quality.**

Publications

1. Siddiqui MM, Iqbal SA, Zulqarnain A, Tabassum A. An investigative study on the parameters optimization of the electric discharge machining of Ti6Al4V. Clean Technologies and Recycling. 2024;4(1):43-60.
<https://doi.org/10.3934/ctr.2024003>
2. Zulqarnain, A., Wasif, M. and Iqbal, S.A., 2022. **Developing a quality 4.0 implementation framework and evaluating the maturity levels of industries in developing countries.** Sustainability, 14(18), p.11298.
<https://doi.org/10.3390/su141811298>

3. Wasif, M., Khan, Y.A., Zulqarnain, A. and Iqbal, S.A., 2022. **Analysis and optimization of wire Electro-Discharge Machining process parameters for the efficient cutting of Aluminum 5454 alloy.** Alexandria Engineering Journal, 61(8), pp.6191-6203. <https://doi.org/10.1016/j.aej.2021.11.048>
4. Jamil, M.S., Khalid, R., Zulqarnain, A. and Salman, M., 2018. **Improving Thermoform Productivity: Case of Design-of-Experiment.** J. Qual. Technol. Manag, 15, pp.87-106.<http://pu.edu.pk/home/journal/22/Previous-Issue.html>
<https://www.prdb.pk/article/improving-thermoform-productivity-case-of-design-of-experim-4615>
5. Malik, T.M., Khalid, R., Zulqarnain, A. and Iqbal, S.A., 2016. **Cost of quality: findings of a wood products manufacturer.** The TQM Journal. <https://doi.org/10.1108/TQM-01-2014-0014>
6. Waseem, A., Zulqarnain, A., Khalid, R. and Saleem, S., 2015. **Gauge repeatability and reproducibility: an assessment of method and medium for a laboratory.** International Journal of Six Sigma and Competitive Advantage, 9(2-4), pp.126-149. <https://doi.org/10.1504/IJSSCA.2015.074961>
7. Zulqarnain, A., Iqbal, S.A. and Khalid, R., 2013. **Implementing Six Sigma methodology in a developing country.** International Journal of Process Management and Benchmarking, 3(3), pp.314-333. <https://doi.org/10.1504/IJPMB.2013.058158>

Awards and Accomplishments

Accomplishments:

As Director of **Industrial Liaison** highlights of significant engagements are:

1. In Collaboration of DICE Foundation-USA, played a major role in arranging Exhibition/Competition/Symposium/Conference/DICE Shark on DICE Energy & Water, and DICE Automotive in 2014, 2015, 2016, 2017, 2018 (in progress) and made joint efforts in establishment of NED-DICE Energy Innovation Center inaugurated by Mohsin-e-Pakistan Dr. Abdul Qadeer Khan at NED University of Engineering & Technology. <https://dice.neduet.edu.pk/>
2. Signed **MoUs** with different Organization including, SUPARCO, Pakistan Cables, Fast Cables, Pakistan Association of Automobile Parts & Accessories (PAAPAM) etc.
3. Developed Standard Operating Procedures (**SoP**) of Directorate of Industrial Liaison.
4. Break through Improvements in Key Performance Indicators (**KPIs**) of Directorate of Industrial Liaison.
5. Significant Improvement in developing Industrial Contacts.
6. Acquired Funds/Donations from various platforms including NED Scholar's, Alumni, and Industries.

7. Commencement of Career Counseling sessions for Graduating Students.
8. Designed One Year Plan-Benazir Bhutto Shaheed Youth Development Program (BBSYDP) headed by Human Resource Research & Development Board (BBSHRRDB) Chief Minister's Secretariat, Government of Sindh.

As Faculty of the **Department of Industrial and Manufacturing**, highlights of significant engagement are:

1. Developed Standard Operating Procedures (**SoP**) for Final Year Projects.
2. Developed Standard Operating Procedures (**SoP**) of M. Engg. /Master of Engineering Management.
3. Played a major role in the development of the Department Advisory Board.
4. Developing close interaction between the Department and industry.
5. Acquired Funds/Donations for the department from industries.

Languages

- Urdu, and English

Memberships and Affiliations

Memberships:

- American Society for Quality (ASQ), USA
- Society of Manufacturing Engineers (SME), USA
- Pakistan Engineering Council (PEC)
- Institution of Engineers Pakistan (IEP)

Affiliation:

- **Certified & Qualified Six Sigma Black Belt, CQSSBB- SQII (Singapore)** (2012/00187)