



## Professor Dr. Syed Arif Kamal

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**Head, Anthromath. Group\*, Dept. of Mathematics<sup>§</sup>**  
**Project Director, the NGDS Pilot Project<sup>∩</sup>**  
**Senior-Most Professor of University**  
**Dean, Faculties of Science & Engg.**  
**Acting Vice Chancellor (April 2-7, 2016)**  
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## LEADERSHIP VISION: ACCOMPLISHMENTS AND GOALS

*My Philosophy of Life*  
*While there is a will there is a way*

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**Summary** — Leadership vision demonstrated in 24 roles played in carrying out progressively-increasing responsibilities (motivation, administration, crisis management, conflict resolution, establishment of national projects/laboratories) for my alma mater (University of Karachi), Higher Education Commission (Government of Pakistan), National Testing Service Pakistan, Defense Housing Authority (DHA) and Karachi Grammar School as well as grooming future leaders through the Early Talent Research Participation Program, resulting in policy change, elevation of education standard, improvement in examination system and involvement of high school students in research activities. This was accomplished through reflection, innovation, discussion, formal training in techniques, working with persons in key positions and research in leadership styles and personality analysis.

**Philosophy** To set and to realize goals, by proper planning, execution, monitoring and evaluation, without compromising ethics and principles; to achieve efficiency and effectiveness, through knowledge, skill and attitude, without affecting relationships; to create opportunities for faculty, staff and students by mentoring and effective delegation, with adequate follow through and follow up.

- |  |  |
|--|--|
| © National Curriculum Revision Committee                                       | ∩ The Early Talent Research Participation Program                        |
| ® Higher Education Commission, Govt. of Pakistan                               | ¶ Transparency International Pakistan                                    |
| § National Testing Service Pakistan  | * Anthromathematics Group  |
| # American Institute of Aeronautics and Astronautics                           | \$ Department of Mathematics   |
| ∩ International Brain Research Organization                                    | ∩ National Growth and Developmental Standards for the                    |
| ∩ The Abdus Salam International Center for Theoretical Physics, Trieste, Italy | Pakistani Children <a href="https://ngds-ku.org">https://ngds-ku.org</a> |
|  | ε United States (of America)   |

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<p><b>DOVE</b>  <i>Indirect &amp; Supporting</i>  <b>(People-Oriented)</b>  <i>Seeks Acceptance</i>            Int. Motivator: Involvement  <b>Consultative Decisions</b>  <b>CONFLICT</b>  <b>TRANSFORMATION</b></p>	<p><b>PEACOCK</b>  <i>Direct &amp; Supporting</i>  <b>(Idea-Oriented)</b>  <i>Seeks Recognition</i>            Int. Motivator: The Chase  <b>Spontaneous Decisions</b>  <b>CONFLICT</b>  <b>MANAGEMENT</b></p>
<p><b>OWL</b>  <i>Indirect &amp; Controlling</i>  <b>(Procedure-Oriented)</b>  <i>Seeks Accuracy</i>            Int. Motivator: The Process  <b>Deliberate Decisions</b>  <b>CONFLICT</b>  <b>RESOLUTION</b></p>	<p><b>EAGLE</b>  <i>Direct &amp; Controlling</i>  <b>(Result-Oriented)</b>  <i>Seeks Productivity</i>            Int. Motivator: Winning  <b>Decisive Decisions</b>  <b>CONFLICT</b>  <b>GENERATION</b></p>

### Conflict resolution and leadership style

<https://www.ngds-ku.org/Presentations/Leader-Integrator.pdf>

**Methodology** Before taking up the charge of Chairmanship of Department of Mathematics, University of Karachi for the first full term in 2003, I attended a number of training sessions, *e. g.*, ‘Skills for Successful Supervision’, ‘Human-Resource Management’, ‘Interviewing Skills’, ‘How to Conduct Performance Appraisals’, ‘Training-Needs Assessment (TNA)’ and ‘Goal Setting’. It is very important to know the personality trait of one’s subordinates, one’s colleagues and one’s bosses as well as one’s own management style. For example, my self an ‘owl’ (indirect and controlling), I have to move at a faster pace and try not to present information in detail with an ‘eagle’ (direct and controlling), whereas I should openly show concern and appreciation as well as learn to compromise with others while dealing with a ‘dove’ (indirect and supportive). With a ‘peacock’ (direct and supportive), I have to be more direct and be further accommodating. I analyze the style of the person, I have to deal with and use appropriate strategy. During the 3-year (full) terms of my Chairmanship of Department of Mathematics (2003-2006; 2012-2015) and the current terms as chairmanship of Departments of Applied Physics (2015-present), Biotechnology (2015-present), Chemical Engineering (2015-present) and Computer Science (2015-present) as well as Caretaker Dean, Faculty of Engineering (2015-present) and Dean, Faculty of Science (2015-present), all major policy decisions were taken after taking into confidence the faculty (in the case of departments) and the chairs/directors/incharges (in the case of faculties). The same strategy was applied in the other roles of leadership, which I had the opportunity to play as Head, Mathematics and Physics, Karachi Grammar School (1979), Head, Departments of Mathematics and Physics, DHA Degree College (1991-1992), Convener, National Curriculum Revision Committee for Mathematics, Higher Education Commission, Government of Pakistan (2004-2012), Convener, Subject Committee (Mathematics), National Testing Service Pakistan (2009-2012), Convener, Sub-Committee (Academics), the Education Committee, Transparency International Pakistan (2011-2014) as well as assignments at the parent institution as Project Director, the NGDS Pilot Project (1998-present), Chairman, Board of Studies for Mathematics (2003-6), Convener, Program in Industrial and Business Mathematics (2003-6), Acting Convener, Testing Services Committee (2008-10, during absences of Convener), Head, Research Groups in Astrodynamics (1995-present), Image Processing (1996-present), Mathematical Biology (1998-present) and Mathematical Physics (2005-present) as well as Director, the Syed Firdous Growth and Imaging Laboratory (2008-present). I am, also, contributing in grooming future leaders as Program Convener of the Early Talent Research Participation Program, University of Karachi (2002-present).

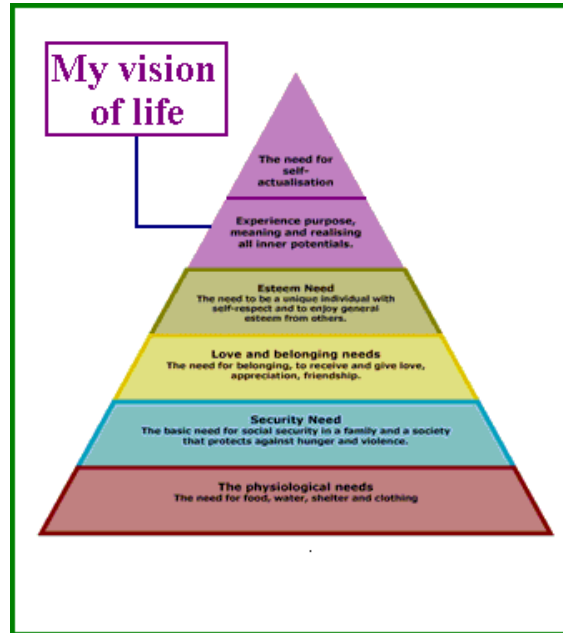
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My vision of life

adapted from [www.popularpersons.org/abraham-maslow4.jpg](http://www.popularpersons.org/abraham-maslow4.jpg)

**Professional Mannerism** Capitalizing on my strengths, which include honesty, integrity, knowledge, ethical and principled approach, networking capability, detail orientation, discipline, devotion and determination, oral and written communication and out-of-box thinking, I am following the below-mentioned etiquettes of professional mannerism:

- *Setting and Realizing Goals*, by proper planning, execution (breakup into targets), monitoring and evaluation, without compromising ethics and principles (*means* are as important as *goals*)
- *Achieving Efficiency and Effectiveness*, through knowledge, skill and attitude, without effecting relationships — efficiency means following deadlines and effectiveness performing task without errors
- *Creating Opportunities* for faculty (including chairs/directors/incharges), staff and students by mentoring and effective delegation, with adequate follow through, follow up and positive re-enforcement

**Research in Management Strategies** Research in administrative and leadership styles includes linking conflict-resolution mechanisms to left- and right-hemisphere functioning of brain, introduction of z axis — innovative skills, along with technical (subject) and performance (managerial) skills, for job seekers as well as mathematical modeling of hard and soft corruption.

Leadership Style	Characteristics	Consequences
Indifferent	Evade and elude	Produces impoverishment
Accommodating	Yield and comply	Produces low productivity
Autocratic	Direct and dominate	Stifles creativity and innovation
Status Quo	Balance and compromise	Provides sub-optimal returns
Opportunistic	Exploit and manipulate	Undermines the organization
Paternalistic	Prescribe and guide	Limits creativity and thinking
Sound	Contribute and commit	Begets synergy and sustained teamwork — establishes robust and fruitful relationships, characterized by trust, respect and frankness

Behavioral leadership styles, shaping the organizational culture — last one is my preferred style

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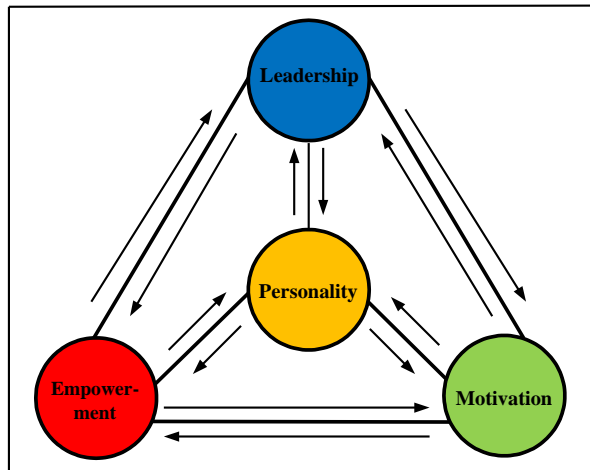
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**Motivation, empowerment and leadership — the ladder to become leader-integrator of the 21<sup>st</sup> century**

<https://www.ngds-ku.org/Papers/J39.pdf>

**Accomplishments (continued)** Board of Studies for Mathematics, University of Karachi, under my chairmanship, prepared and approved BS, MS and PhD programs, in line with revised HEC curricula of 2005. In fact, Department of Mathematics was the first to put forward these curricula, in response to April 5, 2005 instructions of Vice Chancellor. All decisions were taken with consensus. Not a single meeting was adjourned because of lack of quorum.

As Convener of Program in Industrial and Business Mathematics, University of Karachi, I was able to establish industry-university linkage. Faculty from Department of Mathematics gave workshops and professional development short courses for industry. In return, industry offered internships and jobs to our students. Students of morning program could also pursue Masters in Industrial and Business Mathematics.

As Director of SF Growth-and-Imaging Laboratory, Department of Mathematics, University of Karachi gained the honor to stepping ahead of rest of world in anthropometric measurements (heights, masses and mid-upper-arm circumferences can be obtained to accuracies of 0.01 cm, 0.01 kg, 0.01 cm, respectively, at other places these measurements are obtained to accuracies of 0.1 cm, 0.1 kg, 0.1 cm, respectively), growth charts — height and mass values given from 0.01<sup>th</sup> to 99.99<sup>th</sup> percentile (CDC growth charts list values from 3<sup>rd</sup> to 97<sup>th</sup> percentiles, models of child growth and obesity (the first-, the second- and the third-generation solutions of childhood obesity put forward) . Other distinctions of laboratory are world's lightest full-length moiré recording system as well as algorithms for generating Growth-and-Obesity Roadmap of a child.

As Project Director of the NGDS Pilot Project, I was able to provide leadership to my team to develop:

- a) Human-rights and ethical standards for conducting a research project involving minor subjects and parents with little or no education
- b) Inexpensive, indigenously-built anthropometric instruments
- c) Standardized-anthropometric techniques for obtaining reliable and reproducible measurements (manual prepared, containing step-by-step procedures as well as sources of error and hazard/injury)
- d) A method to generate a detailed growth profile of child based on heights of biological father and biological mother
- e) Moiré fringe topography apparatus (a stereophotogrammetric technique) for somato-typing and screening of trunk deformities, without using X rays

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**Accomplishments (continued)** As Convener of Subject Committee for Mathematics, National Testing Service, I was able to formulate, with conscious, policy outline and guidelines for developing GAT (Graduate Admissions Test) items, which was later approved by the Academic Committee, of which I was a member by virtue of being the Vice Chancellor's Nominee.

As Convener of National Curriculum Revision Committee (NCRC) for Mathematics, Higher Education Commission, I was given the task, in 2004, to prepare framework for BS and MS programs (to be introduced for the first time on a national level) as well as bring PhD program in line with equivalent programs in developed countries.

As Acting Convener, Testing Services Committee (TSC), University of Karachi, presented report on the proposed examination system in Academic Council, which was approved by the august body. At the time of conduct of first consolidated test (since the formation of TSC) on January 24, 2010, took key decisions regarding testing of medical doctors, which avoided major clash between the administration and the candidates.

As Head of Department of Mathematics and Physics, DHA Degree College, I supervised a staff of 5, dealt with local suppliers. This assignment provided me a chance to establish Physics Laboratory from scratch.

**Honors** During my current tenure as Dean, Faculty of Engineering (2015-present), Pakistan Engineering Council re-accredited Chemical Engineering Program for the next four years after a very thorough inspection. During my current tenure as Dean, Faculty of Science (2015-present), Karachi University Journal of Science has been revived and Dean's Research Grant Committee was re-structured and brainstorming for new research grant criteria completed.

During my first tenure as Chairman (2003-2006), Department of Mathematics won a grant of Rupees two million, annually, for a period of three years from National Center of Mathematics. Vice Chancellor and Dean, Faculty of Science, both, visited the department twice within a span of six months, Pro-Vice Chancellor three times and Registrar once. Foreign guests, included professors/scientists from Norway and Sweden as well as Former Division Chief, United Nations Capital Development Fund from New York, United States. In the words of Acting Director, the International Center for Chemical and Biological Sciences, Department of Mathematics was on the forefront during this period (during the 16<sup>th</sup> meeting of senate on December 20, 2006).

During my second tenure as Chairman (2012-2015), Department of Mathematics, 3 subject conferences were held in the Department, Program in Sport and Anthromathematics was prepared and approved by all statutory bodies, Program in Mathematics Teacher Education was approved by Board of Studies of Mathematics. A working paper for modifications in 3<sup>rd</sup>-year and 4<sup>th</sup>-year courses was prepared and is under consideration by the current chairman.

The model of MS and PhD courses prepared by NCRC of Mathematics was adapted by committees of other subjects. Department of Mathematics holds the honor of introducing 11 new branches of mathematics during the last 5 years — 7 of them during my second tenure of Chairmanship and 2 during my tenure as Dean of the Faculty, of which Department of Mathematics is a part.

The NGDS team was asked to train master anthropometrists of the Tawana Pakistan team (project conducted by the Aga Khan Foundation). The height-measurement system, developed by the NGDS team, was adopted by the Tawana Pakistan team.

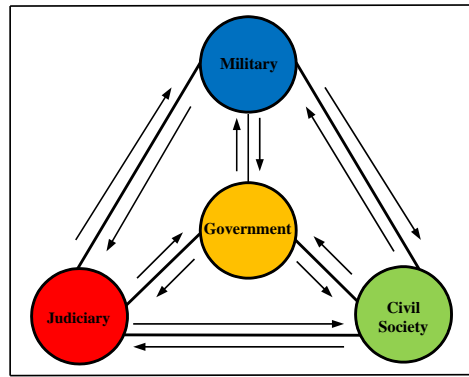
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**Three-way, check-and-balance instruments for spotting soft corruption**  
<https://www.ngds-ku.org/Presentations/Soft-Corruption.pdf>

**Goals** I am trying to work with the senior administration of University of Karachi to make both the Faculty of Science and the Faculty of Engineering outstanding faculties among all such faculties in the entire country by inculcating sense of responsibility, drive and motivation among chairs, directors and incharges at the same time trying to reduce soft corruption in educational administration. In addition, plans are underway to establish Institute of Advanced Study on the model of similar institute in Princeton, New Jersey, United States and the Abdus Salam International Center for Theoretical Physics/the Third World Academy of Sciences, Trieste, Italy. Quality of the faculty, technical aspect of the facilities, functionaries of the constituent departments/centers/institutes as well as the academic freedom to explore, to teach and to disseminate determine prestige of any faculty. I am trying to work on all these fronts, simultaneously, by selecting certain research areas and assembling a slightly better research group, providing slightly better research facilities/laboratories combined with slightly better research ideas from bold and inquiring minds, who have positive thinking for the humanity in particular and the universe in general. Faculty trained by such research group would be able to groom the future leaders of this country (students of University of Karachi) by striking a balance among intellectual, moral and physical upbringings.

### RELATED LINKS

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