

CAN PRESENT SYSTEM OF EDUCATION PRODUCE SCIENTISTS IN SINDH, OR MORE SO IN PAKISTAN?

By
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My professional career has involved me not only in recruitment of scientists, including engineers for different kinds of jobs and train them on the job for specific purposes. This has covered wide range of topics, like mechanical, electrical, civil, industrial and environmental engineering, scientific equipment for higher education, research and industry, agriculture specially value added horticulture, post-harvest technology of horticulture products for export, animal sciences, fisheries, renewable energy, wind mills, solar panels, gasification of agriculture wastes for power production bio-gas, processing agriculture products, mechanised agriculture, irrigation, drainage, water logging, salinity and degraded land reclamation, rain water harvesting etc. My teacher at Madison (Wisconsin) had told me that technology is changing so fast that you have to change your profession five times in the next half a century. He was perfectly right and I have changed profession more than five times. I had two guides in this respect, books and travels to many foreign universities, where I discussed the subject with professors, considered to be, one of the top in the field and benefited to the extent that in Pakistan they consider me one of top scientist though such complements have invariably reminded me of Socrates a Greek philosopher who lived in 469-399 BC and said “people call me wise because I know nothing” . I myself am no more than a beginner.

During the past sixty years I have collected some 25,000 books and bulletins on science and technology, and other 15,000 on horticulture crops printed after 1980. I have discarded twice as much material as obsolete and no longer needed for reference or just to save space for new acquisitions. This change from one field to has been easy due to back ground of study of sciences at Matriculation and Intermediate Science levels. I am always grateful to the British for imposing on us text books of science, prescribed for similar classes at Oxford and Cambridge universities and text books were written by the same authors, and printed from England. The world War-II had brought shortage of paper and new text books were not being published except in new fields like radio, televisions and wireless technologies etc. As a student I had chance to check examination papers of Cambridge university and surprisingly Bombay University teachers were extracting their examination papers from those of Cambridge or Oxford from Matriculation to engineering examinations. I remember having written to Mr. Kewalramani the principal of NED University that there was nothing new they taught me at Texas A&M College for Agriculture Engineering courses, which I had not studied from a poor NED college of a poor country and I had preferred to leave and get practical training with them World's then the largest company of agriculture machinery, International Harvester, employing

four hundred thousand persons and being USA's fifth biggest. This company told me "You cannot learn mechanisation of crops unless you know soils, agronomy of each crop, irrigation, fertilising, plant protection, post-harvest and storage. They gave me many books and manuals on all those subjects published by them. I felt no difficulty in understanding them as one of three text books in first year science of biology course was botany taught in D.J. Sindh College. My experience is that almost all branches of engineering or agriculture are applied physics, mathematics, chemistry and biology. If a student is weak in them, he cannot be a scientist.

The standards of education have been falling. A decade after I left in NED Engineering College in 1949, new candidates of NED had thirty three percent less knowledge than we had been taught under Bombay university. At end of second decade in 1969, Mehran College of Engineering candidates had about 33% knowledge as we had acquired, but this was also year of great disaster for education in interior of Sindh.

A ruthless officer of Anti-Corruption Department wanted every Sindh officer to be removed from job specially those opposed to "One Unit Government's working" Dr. Qadeer Afghan Principal of Mehran College being one, was involved in a false case of refusing to perform supervision of construction an additional duty assigned to him, on the plea that unless transport is made available to him, he cannot go to all sites of construction in an area of thirteen thousand acres or twenty square miles. No transport was provided. The engineer in charge was booked for corruption and Dr. Qadeer was arrested for negligence in delaying the orders, due to which civil engineer in charge had free hand to misappropriate. From jail he sent a word to his students to go on indefinite strike till he is released and in return all students of all classes in Mehran College would pass annual examination and would be promoted to higher class. He was released and kept his word. This was first beginning. Some thing else happened to deteriorate education further. In 1976, two new universities were created out of Sindh university, Sindh Agriculture university and Mehran university of Engineering and Technology. Mehran had strict Pro Vice Chancellor and two senior professors, who discouraged copying, which had become a rule, but then Minister for Education Sindh visited university and stopped all the three of them from visiting examination hall, so that students freely copy and pass. This was a serious blow to technical education in Mehran University and yet Vice Chancellor and some professors sincerely tried for improvement, but copy culture was now fully established and threatened those, who wanted to maintain standards.

After defeat in East Pakistan, the Government to reconcile people to the new situation emphasised in Pakistan Studies a subject to be taught at all levels in the schools and universities. General Zia him-self son of a Mula of mosque in Jalandar, made introduction of Islamic way of living as true ideology of creation of Pakistan and the subject was introduced at all levels from the primary to university level. Before this in 1966 there was agitation to replace English by Urdu in the government offices as well as in educational institutes. President Field Martial Ayub after set-back in 1965 war and Tashkent negotiations, had lost prestige and surrendered. Sindhi teachers and students agitated that Urdu is as alien to Sindh, as in Bengal, so Ayub's government surrendered. This was unfortunate for education Pakistan.

On the other side of the border Government of India in 1948 had decided that Hindi will replace English and a Committee of experts was formed to coin technical phrases and words for those of English. A story was current then that the committee met Prime Minister Nehru in 1963 and informed him that some four hundred thousand words had been coined and equal number of words of new terminology developed since end of World War-II in 1945, had to be coined. Nehru just asked a simple question. How many words has the Hindi language? The reply was, one hundred thousand. Nehru then asked, under such situation can Hindi easily absorb those four hundred thousand words and phrases? The result was putting the issue into cold storage for ever. India's strong point is; English as medium of instructions, whereas, we are no where. It is worth point that Nehru was not only a statesman, but literary giant whose glimpses in World History and Discovery of India are classics.

Although English is still continued a medium of instructions at higher level, but use of Urdu and Sindhi at High School and Intermediate level in technical subjects and less emphasis on English language, has produced students, who cannot not read text books in English and the substitute is local text books summarised from large English editions and which did not impart correct concepts of these sciences.

I have been interviewing all kinds of candidates to be trained as farm managers for the past fifteen years. I found that the present Kamdars (foremen) used on the farms are incompatible with advanced agriculture and more so with horticulture I wanted to replace them. I have advertised periodically in news papers and also put advertisements on notice boards of various departments of universities at Jamshoro, Tandojam, and Khairpur during the past fifteen years.

Getting less response, I talked to a professor, who told me that candidates want easy jobs, easy time, facilities like furnished office, electric bell to call peon for cup of tea on reaching office, relax for while, walk around the farm, for one round of short duration and return back to office. Your systems is that each manager in charge of 5-10 labourers to get some job done during the day or week, switch over to other jobs and continue year around on different jobs on different fruits. You are doing unconventional agriculture which involves new crops, dwarf trees, high density tree planting, Foliar feeding of fertilisers, use of micro-nutrients, elimination of synthetic pesticides, mulching of trees, no use of tractors and inter-cultivators, organic agriculture and use of natural pesticides. All these are labour and supervisory intensive. This means strict timing and supervision and your timing is 8.00 am to 5.00 p.m. with two hours break in summer and 8.00 am to 4.00 p.m. in winter with one hour break. He said that he had discussed with many graduates and post-graduates and they think that they do not like this kind of punctuality. A few astray candidates did come for interviews and though some how none was up to the mark, yet I thought they could be trained on the job and made offer to them. Only a few joined and who were trained on the job. To our utter surprise when some jobs were advertised by government or some private parties, they applied and were immediately taken up without asking any questions, stating that the employers know the quality of work the candidate must have learnt at our farm and therefore were immediately employed.

Recently we needed some twenty persons and advertised for a walk in interview of any graduate in any field and bring with them selves marks of matriculation and intermediate. Some 200 candidates appeared. They were graduates in engineering, sciences, agriculture engineering and social sciences. The number of graduates in liberal arts and social sciences was limited. What we found was shocking and needs attention of whole nation. Almost 95% of them had over 85% marks in Sindhi, Urdu, Islamiat and Pakistan Studies. They had between 40-50% marks in English. In six practical of physics, chemistry and biology accounting for 25 marks each or total of 150 marks, they had 23 or 24 marks out of 25 i.e., 92-96%, but in theory papers of physics, chemistry, mathematics and biology, they had just pass marks or a few more than 33%. Enquires were made to find how students in practical got 138-144 marks out of 150 in science practical. We were informed that practical take place in the very colleges students attend. They take tuition and pay the teachers, who in turn get them these marks. Some had even failed in theory, but were condoned. The problem to ponder about is that they got high percentage marks in arts subjects and got admission in scientific universities, because of those subjects and not of sciences. It was concluded that they cannot be scientists all their life. Further examination showed that though they were B and C grade in Matriculation and Intermediate but, they were first class in the universities from the first year to the last. How this miracle happened needed further probe?

Some ten years ago I applied for a World Bank project and found a very suitable person in one of the universities. I offered him Rs.50,000 a month, while university was paying him Rs.18,000. He agreed and when project was about to mature, he backed out on the plea that he had to help his students in writing their thesis for MSc and he was not interested in money, but service to nation. I thought he was great, but told of this sacrifice on his part to another professor of the same university. He told me that he was not madman but I was. He charges Rs.20,000 per thesis, with guarantee to pass the student, pays about 16,000 as income tax on his salary of Rs.216,000, saving Rs.200,000, but he makes another Rs.300,000 from writing thesis himself for students, making a total of Rs.500,000. Even if he has 10 students, he will make Rs.400,000. It was surprising, but on questioning about thesis, some candidates admitted that their thesis was written by their teachers and payment which was customary. I remember my own days. After graduation from NED college, I went to work with. Buckwell and Co. They put me in charge of repair shop, where on the first day, after a caterpillar tractor engine was opened, I realised that text books knowledge was totally out-dated and I started my higher education on the job, from that day onwards and I am learning some thing new every day and some times every hour. My new teachers for the past 56 years are the latest books.

Recently a friend of mine brought his son studying in class IX in a prestigious high school at the campus of an important university and asked me to examine his IQ and see his aptitude for his future career. Before further enquiries I ask him how much he liked arithmetic, algebra and geometry. He said that they do not teach geometry in the school, as none of the teachers in the school knows the subject. I told him engineering sciences are out of him, as he cannot fully

understand trigonometry, solid (or three dimensional) geometry, cannot handle engineering drawings properly, cannot design any engineering civil or mechanical engineering structures or mechanical components as various forces on these structures need application of geometry. He cannot enter into space technology as it involves astronomy which needs application of plane and solid geometry. I told him that he simply cannot have grasp on physics, without geometry. Engineering is applied physics, as such in principle it is applied geometry. Geometry teachers, reasoning and logic and trains man's mind. Its deductive structure has created thinkers and philosophers, since the time human being was created.

Then I pulled a classical book from my library; "The 100 ranking of most influential persons in history", by Michael Hart and showed him and his father that out of 100 important lives, Euclid has been placed as number 14, much above Moses Darwin, Augustus Caesar, George Washington, Karl Marx, Napoleon, Graham Bell (telephone inventor), Asoka, Otto (petrol engine inventor), Julius Caesar, John F. Kennedy, Lenin, Tao, Zoroaster and Mahavira (Jain Prophet). Among the persons more influential than him were Prophet Muhammad (PBUH), Newton, Christ, Buddha, Confucius, Columbus and Einstein.

I told them that geometry definitely was a difficult subject compiled in scientific lines by Euclid, but it is more important than arithmetic and algebra and helps a person to develop analytic mind. I told that the Chinese, Indians and Japanese had not produced good scientists until they learnt geometry in the eighteen and nineteenth century. All European scientists starting from sixteenth century right up to Einstein were excellent in geometry. Newton who is considered by the as the World's number two important person and only Prophet Muhammad (PBUH) leads him, was so imbedded in Euclid's Elements (geometry) that he wrote his great work "Principia in geometrical form". My final advice to this young man was to join services which do not need brains and without geometry we are turning out stupid.

In new post World War-II era, there will be many people who would keep researching and learning throughout their life. A quarter of century ago, US had planned that of their population, 45% will be white collared and 55% blue collared. The white collared would be of BA-BSc level and of them 15 would have MA-MSc education. Again of these 15 persons, 7 would go for Ph.D. All those 7 would be involved in research and development all their lives. Exactly opposite is the case in Pakistan. On leaving the university, they give life long vacation to their books, read and experiment little and boast as if new technologies are revealed to them every day.

I do part time farming for my living. The farm is one hundred and three acres orchard, where I grow fruit crops like mango, lychee, longan, peaches, apples, grape fruits, grapes and pomegranates for past forty years. From the beginning in 1965, I had observed that labour will work only if supervised very strictly by foremen called Kamdars. However tragedy was that these Kamdars had risen from labour and were equally ignorant, but had become crafty due to their position and continuously created problems, which they alone could resolve with labour or neighbours and made owners helpless. Their main defect is that they neither know the

technology nor are willing to accept any advice beyond what others do and any thing new is totally wrong, and they refuse to accept or execute it. I lost thousands of plants and scores of new varieties of fruits and other crops due to their open negligence and considering it unworkable. My conviction is that unless the supervisor is motivated and convinced that what he is doing is right, he will not execute the assignment properly. I tried to introduce new innovations from the beginning, but Kamdars rejected them and did not execute them. I tried to introduce new crops and with them mortality rate some times was 100%. Finally I got hold of some MSc's in Agriculture who though technically poor, were at least amenable to discipline and were willing to carry out experiments as I suggested to them, but were hindered and ridiculed by Kamdars. One Kamdar told these MSc's and B.E's that his knowledge starts, where theirs ends. On this I decided to get rid of the Kamdars once for all and try educated ones. Between 1990 to this day I have advertised a number of times interviewed many. I found many of them technically very poor and unwilling to work. I knew the reasons and causes of lack of knowledge, but that gap was easy to fill if they were only willing to carry out the instructions for which I decided to prepare a monthly instruction manuals. A large majority of candidate were reluctant to be punctual to timing of 8 am to 5 p.m. and also were not willing to supervise work of labour in the field. Only those needy would join. These usually were those, who had remained unemployed for 5-8 years and had learnt that their education was too defective to keep them employed.

The basic cause of this deterioration of education is the syllabus and education beginning from the Primary school level. In the primary schools they taught geography from primary class II to Matriculation a total of 11 years, starting with geography of Taluka or Tehsil, district, Sindh, India, Asia and World, but both political and physical, including solar system and galaxy. In history they started in Primary class IV with history of Sindh, then of India in brief in the lower classes and in the higher classes in more details and analysis. Then started history of England from 1500 AD along with history of India for four years. History of England was in brief history of World. Most important subject in primary education was arithmetic which indirectly taught to analyse. Matriculation examination had Mathematics, physics, chemistry as compulsory subjects and even clerks and typists in the government service had to be matriculates knowing these subjects. These subjects developed higher level of IQ among students to think for themselves We eliminated these and made two categories of matriculates in humanities and sciences. This trickled down to primary level and arithmetic was the first victim of new educational policy. In my opinion lack of good standard of mathematics has caused the worst damage to education.

I have been visiting university libraries periodically in search of some material on engineering, horticulture and Sindh. I have seen only a few teachers visiting the libraries. Students do visit, but majority of them to read news papers. Many librarians are well qualified, but funds to purchase books are lacking. In case of most technical libraries only a few books are imported after 1965. Many local or Indian technical books are substandard. Sindh Agriculture Research has purchased books under Agriculture Research Project-II, but all of them are Indian publications and mostly substandard. Cost involved in foreign exchange was millions of dollars.

The amount could have been well spent by import of standard books from the Western countries. This is what happens to loans and aids, our future generations have to pay.

After 1966, teachers took standard text books of 400-500 pages summarised them in fifty pages of notes and taught from these notes. As standard of the English language was very poor students could not refer to original texts and depended on notes. Since most of the students were granted first class at the university, they were selected as lecturers and taught from the same notes. In 2005 they are still teaching from the same notes prepared in 1966. The teachers them-selves have such poor knowledge of both the English language and the subject they teach, that they cannot grasp the subject them-selves. They them-selves are the examiners and set papers. At end of the semester, they issue a paper of probable questions, the final examination may have and it lists 100% questions that are in the final examination. One tragedy is that because of poor standards of English, they cannot pass TOFEL and other examination conducted by US and other Consulates and the only foreign universities available to them in the past were Eastern Europe, Russian, Philippines, Egypt and Thailand etc. In most of them there was different syllabus for foreigners and they got Ph.D. degrees very easily, without adequate knowledge. Such teachers have not improved the standards of students. Being aware of the low standards of education, the government decided that any promotions beyond the level of Assistant Professor would be from PhDs of the subject. On this has started rush to register for Ph.D. It is not American system of studying 40 or more subjects and a research thesis for PhD in addition. It is a British system of PhD by thesis, but the British make students to carryout research on latest topics with all facilities and candidates have to work day and night. In Pakistan thesis are written by some senior teachers for their juniors, against some payments. Some ten years back rate was Rs.40,000 for PhD and today it must be multifold. The reward for Ph.D. to a teacher is increment in salary by Rs.5,000 per month, but the same amount is to be paid as extra to normal pension after retirement and costs university more than rupees one million per Ph.D. The favouritism to admit or not to candidates for Ph.D. degrees has been a rule since 1960 and many brilliant persons were refused admission on some or other pretext, but now degree is a marketable commodity.

How every student in the universities in Sindh secures first class is a complex issue. There are strong political groups among the students and on new admissions, they recruit various students to their groups. These groups are utilised by the teachers against administration. Teachers put pressures on Vice Chancellors in cases of new recruitment's, promotions and other facilities and when denied, students groups are called upon to agitate for removal of Vice Chancellors. All student co-operate in return for first class in every subject. The recruitment pattern also shows that relatives and children of senior or influential teachers get jobs in these very institutes by same tactics.

The education has been systematically destroyed by changes in syllabus from the Primary school level and beyond. During the British rule there in Sindh was a test called Vernacular Final Examination of eight papers conducted by the Government of Sindh after completing eight years of Primary education. The candidates who passed it were qualified to be taken up as Primary

School teachers, Tapedars (low level revenue officers) , Abdars for distribution of water in Irrigation Department and Munshis in the courts. Such was the high standard that not many matriculates of Bombay University could pass it. It was tough in arithmetic, geometry, history of India, geography of world, commercial accounts, general science, advanced Sindhi grammar, and Sindhi literature. The candidates were recruited as teachers and after some years experience were sent to Teachers Training College Hyderabad for updating for a year at a time and a total of three years. Such were the high standards, that when Sindh University started Sindhi language classes for Masters degrees, these primary teachers were brought in ,to teach Sindhi language and they worked in place of senior professors for many years. After independence the government changed rules of recruitment of teachers and allowed Middle class pass students of High School to become teachers. The Primary Educational Systems was immediately destroyed. The present recruitment of teachers allows Intermediate (Class XII) pass students to become Primary teachers, but majority of them have studied only humanities or liberal arts and cannot teach arithmetic or science subjects. The result then is the students weak in sciences and arithmetic, remain weak in mathematics and sciences right up to university level. One would wish that old Vernacular Final Examination System is restored to recruit teachers and we begin afresh; but then question is, will the examination be honest? This is where I see dead end of street.

(Regrets: I do not have first hand knowledge of Karachi and other provinces, but heresy is not different).