

Changing trends in S&T education in the universities of Punjab

Punjab state for a population of 30 million has the highest density of 30 universities, including 16 universities sanctioned in the private sector. The Malwa belt of Punjab was considered educationally the most backward area till 1970, but now it can boast of five universities in Bathinda district alone. There are more than 100 colleges of engineering and technology in the state. Till 2011, all the seats in engineering colleges were filled up, but the trend has been changing since then. During 2016 admissions, out of 25,000 seats available, only 10,000 seats got filled up during the first counselling, indicating a declining trend for admission in engineering courses in Punjab. I learn similar trends are noticed in other states neighbouring Punjab.

On the other hand, the admission in Basic Sciences and Humanities courses

has been showing a rising trend since 2011 in universities of Punjab. For example, in SGGS World University, Fatehgarh Sahib, the admission to M Sc in Physics has almost increased three-fold in five years. Another big surprise is the male/female ratio in basic science courses. It used to be tilted heavily towards male in the beginning of the 21st century, but now in 2016, the female students are outnumbering the males by a factor of 5 : 1. The same trend is visible in candidates opting for research in basic sciences where the number of female scholars has shown an upward trend since the last decade.

There is a need for evaluating the impact of changing trends in universities of Punjab. The young faculty teaching basic science courses is already showing a changing trend from male domination to

female domination in the colleges. Its impact will be visible in the universities in coming years. The funding agencies such as UGC and DST have boosted this trend in research by providing incentives for female candidates. It is highly encouraging that compared with Europe and America, India has empowered its women with training in basic sciences leading up to Ph D, and making them employable in universities and National level research institutes during the 21st century.

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Plants outdoor: thick and thin

A major snow blizzard occurred in USA in January 2016 affecting several million people. The beginning of the storm was given various names like *Winter Storm Jonas* and *Snowzilla*. The American media reported details of heaps of snow 91 cm that fell during 22–24 January 2016 and the related death of at least 55 people¹. A similar blizzard had occurred in 1999 just after New Years' Day, forcing the temperature to dip below -29°C , and in some areas -45°C , killing at least 73 people and causing an estimated loss of US\$ 300–400 million. Between 2 and 4 January 1999, 55 cm of snow covered the lanes of Chicago¹. The disaster was described as the second worst blizzard in

Chicago in the 20th century. The worst blizzard of Chicago in the 20th century, which occurred on 26 January 1967, witnessed 58 cm of snowfall. Closer home, a German Sikkim Expedition to Kanchenjunga in 1936 reported one of the early snow blizzards in the region². Blizzards of devastating magnitude would make headlines in the international press. Bankura district in West Bengal, India rarely makes headlines in the international press, not even for the infrequent, but recurring droughts that the local inhabitants have faced and lived. Life outdoor experiences a temperature difference of 38°C given the fact that the outdoor temperatures range between 7°C and 45°C (ref. 3).

The outdoor plants in Chicago are exposed to temperature variation of 50°C or more during winter. The widest span in the difference in temperature in Antarctica is well above 100°C (Table 1). The 10°C rule of thumb states that the reaction rates of many catalytic reactions can approximately double over a span of 10°C . In addition to catalysis, aspects of transport, rheology and protein stability *in vivo* are drastically altered when the living cells are exposed to such thermal changes in the environment.

Rural pasture is full of extraordinary simplicity but poses challenging questions in basic sciences delving into the thermal tolerance of the living molecules

Table 1. Data on the variation of outdoor temperatures recorded in four places around the world

Place	Lowest temperature ($^{\circ}\text{C}$)	Highest temperature ($^{\circ}\text{C}$)	Difference ($^{\circ}\text{C}$)
Antarctica	-89.2	17.5	106.7
Bengaluru	7.8	38.9	31.1
Delhi	1.1	47.8	46.7
Kolkata	3	43.9	40.9

Note: Data were obtained by Google Search using the query string 'lowest temperature in <city name> ever-recorded' or 'highest temperature in <city name> ever recorded' on 27 February 2016.

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in the plants outdoor. Understanding of life at low and ultra low temperatures helps betterment of the art of preservation – be it the storage of food, poultry and dairy products or the body organelles for transplantation purposes or possible novel approaches to mummification. Venturing into the quest of extraterrestrial life, sub-zero modern biology may link physical sciences with biological

sciences in a more productive manner consummating into modern natural sciences.

3. <http://www.wbagrimarketingboard.gov.in> (retrieved on 27 February 2016).

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1. www.wikipedia.org quoting the *New York Times* and the *Chicago Tribune* (retrieved on 27 February 2016).
2. www.alpinejournal.org.uk (retrieved on 27 February 2016).

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