

## Wearable sensors to track babies heart rates

London, : Scientists have developed new wearable graphene-based sensors that could allow parents to keep track of their babies' heart and breathing rates with automatic updates to their smartphones.

The sensors which the researchers describe as "the most sensitive liquid-based devices to have ever been developed" could also be transformative for anyone with life-threatening conditions such as sleep apnea. Since graphene is cheap to produce, the new break-

through should be affordable, they said.

Physicists at the University of Sussex in the UK created a liquid made from an emulsion of graphene, water and oil, which conducts electricity.

The team was inspired to create the new health monitor after the Bill and Melinda Gates Foundation called for new affordable wearable health technologies for babies in situations where resources are scarce.

Graphene is a two-dimensional material made from

carbon atoms that is strong, flexible and conductive.

When a channel or tube holding the liquid is stretched, even by a small amount, the conductivity of the liquid changes.

This means that the respiration rates and pulses of people wearing the device can be tracked.

Since the new liquid technology is so sensitive, it picks up very small signals when attached to the body.

In order to monitor the pulses of babies at the moment, clunky sensors need to be

attached to babies' tiny feet

or hands, which often fall off. The information is then relayed to a monitor by wires which can restrict the child's movement.

"Using the conducting liquid emulsions we have developed, we will produce cheap, wearable sensors based on graphene. The devices will be comfortable, non-invasive and can provide intuitive diagnostics of breathing and heart rate,"

said Professor Alan Dalton from the University of Sussex.

The researchers eventually



want to developed a suit that a baby can wear, which will read-out all vital information wirelessly. "We hope to see this made available within two to four years," said Dalton.

"In the laboratory we have created a sensor that has the potential to drastically

improve early detection of life-threatening symptoms such as sleep apnea or cardiac arrhythmia, where constant monitoring with conventional equipment is challenging outside of the hospital environment," Matthew Large, lead researcher on the project added.

## Women outlive men even during crisis

Women not only outlive men in normal times but also during the worst of circumstances, such as famines and epidemics, according to a study which challenges the notion that females are the weaker sex. This advantage in times of crisis may be largely due to biological factors such as genetics or hormones, researchers said. Most of the life expectancy gender gap was due to a female survival advantage in infancy rather than adulthood, they said.

In times of adversity, newborn

girls are more likely to survive, the researchers found.

The fact that women have an edge in infancy, when behavioural differences between the sexes are minimal, supports the idea that explanation is at least partly biological, they said.

Led by researchers at the University of Southern Denmark and Duke University in the US, the team analysed mortality data going back roughly 250 years for people whose lives were cut short by famine, disease or other mis-

fortunes.

The data spanned seven populations in which the life expectancy for one or both sexes was a dismal 20 years or less.

Among them were working and former slaves in Trinidad and the US in the early 1800s, famine victims in Sweden, Ireland and the Ukraine in the 18th, 19th and 20th centuries, and Icelanders affected by the 1846 and 1882 measles epidemics.

The researchers discovered that, even when mortality was very high for both sexes, women still lived longer

than men by six months to almost four years on average.

Girls born during the famine that struck Ukraine in 1933, for example, lived to 10.85, and boys to 7.3 - a 50 per cent difference, researchers said.

When the researchers broke the results down by age group, they found that most of the female survival advantage comes from differences in infant mortality.

Newborn girls are harder than newborn boys. The results, published in the journal PNAS, suggest that the life expectancy gender gap can



not be fully explained by behavioural and social differences between the sexes, such as risk-taking or violence. Instead, the female advantage in times of crisis may be largely due to biological factors such as genetics or hormones.

Estrogens, for example, have been shown to enhance the body's immune defences against infectious disease. "Our results add another piece to the puzzle of gender differences in survival," the researchers said.

## Decoded: Why is yawning so contagious



New York: Ever wondered why even if we are not tired, we yawn if someone else does?

It is because the human propensity for contagious yawning is triggered automatically by primitive reflexes in a brain area responsible for motor function, a research suggests. Contagious yawning is trig-

gered involuntarily when we observe another person yawn it is a common form of echophenomena the automatic imitation of another's words (echolalia) or actions (echopraxia). The findings showed that our urge to yawn is increased if we are instructed to resist yawning. And no matter

how hard we try to stifle a yawn, it might change how we yawn but it won't alter our propensity to yawn.

"This research has shown that the 'urge' is increased by trying to stop yourself. Using electrical stimulation we were able to increase excitability and in doing so increase the propensity for contagious yawning," said Georgina Jackson, a Professor at the University of Nottingham.

"The findings may be important in understanding association between motor excitability and the occurrence of echophenomena in a wide range of conditions linked to increased cortical excitability and/or decreased physiological inhibition such as epilepsy, dementia, autism, and Tourette syndrome," added Stephen

Jackson, a Professor at the varsity.

For the study, published in the journal Current Biology, the team used transcranial magnetic stimulation (TMS) to analyse volunteers who viewed video clips showing someone else yawning and were instructed to either resist yawning or to allow themselves to yawn.

"If we can understand how alterations in cortical excitability give rise to neural disorders we can potentially reverse them. We are looking for potential non-drug, personalised treatments, using TMS that might be affective in modulating imbalances in the brain networks," Jackson said.

Echophenomena isn't just a human trait, it is found in chimpanzees and dogs too.

## Dearth of educators for teachers

New Delhi: More than 45 per cent of faculty positions are lying vacant across teacher education institutions in the country. With the central government increasing its focus of taking corrective measures to improve teacher education in the country, the less number of teacher educators paint a bleak picture. There are four types of government funded teacher education institutions - District Institutes of Education and Training (DIETs), Colleges of Teacher Education (CTEs), Institutes of Advanced Studies in Education (IASE) and State Councils of Educational Research and Training (SCERTs). Providing answer to a written question in Lok Sabha on Monday, minister of state human resource development, Upendra Kushawaha informed that as per schemes, 45.56 percent posts of teacher educators are vacant across all insti-

tutes in India and as per state, 39.36 percent seats are vacant. "Filling up of existing vacancies of academic posts in teacher education institutions is the prerogative of the respective state and union territory government. However, in the Teacher Education Approval Board (TEAB) meetings which are conducted annually to consider the annual work plan and budget, they have been encouraged to fill up existing vacancies on a priority basis and financial assistance for filled up posts is also provided to the States/UTs," he added. The National Council for Teacher Education has recently prepared fresh accreditation norms B.Ed colleges across the country, laying emphasis on the quality of teaching. As per the new rules, the institutes will also be given ranking by the council on the basis of their performance.

## Watching TV for five hours may affect mobility in elderly

New York: Older people who watch more than five hours of television a day and indulge in three or lesser hours of physical activity in a week were at more than three-fold higher risk of being unable to walk or having difficulty walking, researchers warned. The findings showed that people who watched five or more hours of television per day had a 65 per cent greater risk of reporting a mobility disability, compared with those who watched television for less than two hours per day. Television viewing in the evening may be especially detrimental to health because it is not broken up with short bouts of activity, compared with sitting during the



day. "Television viewing is a very potent risk factor for disability in older age," said lead author Loretta DiPietro from the George Washington University. Younger people might be able to get away with sitting for long periods because they are physiologically more robust. But after age 50, prolonged sitting,

and especially prolonged television viewing, becomes particularly hazardous, DiPietro said.

"We've engineered physical activity out of our modern life with commuting, elevators, the internet, mobile phones and a lifestyle that often includes 14 hours of sitting per day," DiPietro

said. "Our findings suggest that older people who want to remain fit must ramp up their daily physical activity and reduce the amount of time they spend sitting." DiPietro added. For the study, published in the Journal of Gerontology: Medical Sciences, the team analysed data which kept track of men and women aged 50 to 71 from six states and two metropolitan areas, nearly 30 per cent of the previously healthy participants reported a mobility disability-having difficulty walking or being unable to walk at all. "To stay active and healthy as you age, move more and sit less throughout the day every day," DiPietro added.

## Kids forced to attend classes in damaged bldgs

Dehradun: Non-allocation of funds for the repair of a school building badly damaged in 2013 flash-floods has forced authorities to hold classes for their primary school students in another less dilapidated school in Uttarkashi district. Nearly 500 school buildings are in dilapidated condition across the state.

"The neighbouring Junior High School's authorities were kind enough to spare rooms for our students," said Yashwant Singh Chouhan, the Principal of the primary school Beshti in Purola area of the district.

"While rains inundate the classrooms, even with no

rains, our school building is not safe since it was badly damaged in the 2013 flash-floods. Ramshackle ceilings and walls threatening to collapse any moment," he said.

Assistant block education officer, Purola, Dwarka Prasad Pandey, said the primary school at Beshti was "just one example".

"This is the condition of nearly 1.5 dozen schools in the block since the 2013 Uttarakhand disaster," he said. An estimate of expenses to be incurred over the repair of these school buildings has been sent to the district education officer for sanction but the funds were yet to arrive, Pandey said.

## People who try one cigarette become daily smokers

London, PTI: Over two-thirds of people who try their first cigarette go on to become daily smokers, at least temporarily, a study suggests.

The finding from over 215,000 survey respondents provides strong support for prioritising efforts to reduce cigarette experimentation among adolescents, researchers said.

"This is the first time that the remarkable hold that cigarettes can establish after a single experience has been documented from such a large set of data," said Professor Peter Hajek from Queen Mary University of London in the UK.

"In the development of any addictive behaviour, the move from experimentation to daily practice is an important landmark, as it implies that a recreational activity is turning into a compulsive need," said Hajek, who led the study published in the journal Nicotine & Tobacco Research.

"We have found that the conversion rate from 'first time smoker' to 'daily smoker' is surprisingly high, which helps confirm the importance of preventing cigarette experimentation in the first place," he said.

The researchers searched the Global Health Data Exchange for relevant



surveys from the UK, US, Australia and New Zealand that included questions about ever trying a cigarette and ever smoking daily.

The team calculated that 60.3 per cent of respondents had said they had ever tried a cigarette, and among those, an estimated 68.9 per cent

said they had progressed to daily smoking.

Given the high conversion rate found in all existing surveys, the researchers suggest that at least

some of the reduction in smoking prevalence observed over the past 20 years is likely due to reduced experimentation with cigarettes among adolescents. "Concerns were expressed that e-cigarettes could be as addictive as conventional cigarettes, but this has not been the case," Hajek added.

"It is striking that very few non-smokers who try e-cigarettes become daily vapers, while such a large proportion on non-smokers who try conventional cigarettes become daily smokers. The presence of nicotine is clearly not the whole story," he said.

## YOUNG WORLD

### Through the critical glass



Students need to read between and beyond the lines to become reflective and independent thinkers.

A few days ago, I received this message on WhatsApp: "A loud thought: In 1945, USA attacked Japan with a nuclear bomb. Today, after 71 years USA cannot sell a needle in Japan. This is not due to trade policy. This is because the Japanese citizens do not buy anything which is made in the USA. This is called real patriotism and unity. We Indians can do it against China. We all need to unite. China is our number one enemy country. Do not purchase any Chinese product from today. Be Indian and buy Indian. Share this message with everyone."

Out of curiosity, I shared this message with ten of my friends to know how they would react to it. Later, when I checked with them, I found that nine of them had shared the message with their friends. A similar experiment was carried out in a classroom in a college and the majority of students said that if they had received the message they would have just shared it. Many said that they accepted the message without questioning and analysing it; some said that they were carried away by the word 'patriotism' and a few said that China was a great threat to India.

When I received the message from a friend, a highly qualified academic, I sent these questions as my response: Is it an authentic message? Is it true that Japanese people do not buy products from the USA? Are those Japanese people who buy US-made products unpatriotic? What is patriotism? Is China really a number one enemy to India? Who is the author of the message? What is his/her real intention? Fact-check

How accurate is the message? Three years ago, I attended an international conference in Ahmedabad. About ten delegates from Japan too attended the conference. Most of them had Apple iPhones/laptops. One of them had received his master's degrees from a U.S. university. According to the Economic Complexity Index (ECI), the United States is the second largest export economy in the world and Japan is its third top export destination. What can be deduced from these facts is that Japanese people do use American products. It seems that the one who created the message has pathological hatred for China. This message can poison the minds of those who lack critical reading skills.

In the 21st century media mediated society, social media is flooded with such posts. Without checking the authenticity of the posts, many form opinions, generate views and share the same with everyone they know. What is the outcome? We create a society where post-truth dominates our political and social discourse. The fact that all news, messages and posts are constructed the way the authors want them to be constructed, invites us to be critical readers of such texts. A month ago, the following message purportedly written by Google CEO Sundar Pichai was making the rounds on social media:

"I'm not interested in politics but I'm worried about India's unemployment and millions of youngsters losing their jobs. India must concentrate on people's welfare not on their food habits. Eating Beef or any food is purely personal freedom. No one has right to ban it. We don't live in Dark Ages where King decides on people's Freedom. Great Country like India must move towards Science and Technology but not Religions..." — Sundar Pichai, CEO, Google

It came as a big surprise to me when I noticed that the quote was circulated even by academics. No wonder many Indians took to Twitter and hurled abuse at the Google CEO. If people had read the message critically, they would have realised that it was a fake quote. The misspelling of Sundar Pichai's name, his background, his current position, and incorrect grammar and punctuation in the text should have helped them to dismiss it as a fake quote.

It is true that educational institutions in India have failed to promote critical reading among students. The myth that authorities, teachers and textbooks should not be questioned has been so firmly established in our consciousness and perpetuated for centuries that very few dare to puncture it. Developing learners' critical reading skills is essential in the 21st century, and without this, education is incomplete.

Critical reading is an extension and application of critical thinking. It can be defined as a process of questioning, analysing, interpreting and evaluating a text. It is a deeper engagement with the text. It is not merely seeing the surface structure (sentences) but looking into the deep structure (meaning). It is reading between the lines and beyond the lines. When critical readers read between and beyond the lines, they know what is implied in the text, discover the intention, tone and attitude of the author and bring out the truth with their deeper analysis and synthesis.

Students must be taught to look at any text through critical glasses. The following questions will help them become critical readers: What is the intent (motive, purpose) of the writer? What is the tone of the text? What is the author's background? Are the sources reliable? Do you believe what you have read? Do you agree with the author? Is there anything in the text that does not make sense to you? What are the claims and supports in the arguments in the text? Are the arguments convincing? Why has the writer used certain words and phrases in the text? What are the connotations of the words and phrases? Has the author failed to include certain facts, details and examples? What is my personal response to what the writer has written?

In the post-truth era, we are bombarded with messages that contain half-truth or no-truth and posts that are propagandistic. Certain news reports contain not just news but views too. It is presented in such a way that readers are made to believe the reports. It is high time that the educational institutions took steps to help students become reflective, independent and critical thinkers.

While I was typing this article, I received this tweet from a friend: "The thing about quotes on the Internet is that you cannot confirm their validity." — Abraham Lincoln