New Delhi: It’s not big buildings or world-class facilities that make a great school. Exceptional education and good teachers do.

Former President APJ Abdul Kalam stressed on Monday that primary education should be delivered in an integrated way by promoting affinity among parents, students and teachers.

Speaking at the Schoolonomics 2011 conference organized by The Times of India, in association with The Millennium School, Kalam urged all stakeholders to work on improving primary education as a priority. He also suggested various ways and models to ensure that knowledge prevailed in the schooling system, dropouts were prevented; the community participated in the uplift of education and technology made education more effective.

Addressing the audience with unmatched enthusiasm, Kalam recalled his student days spent at Rameswaram Panchayat Primary School more than six decades ago to illustrate how good teachers make all the difference. “My school had an unimpressive building and scanty amenities. We were 55 students in class VIII. Even if one student was absent for a day, our teachers would go to the parents and enquire about his/her welfare. If a student got high marks, the teacher would be the first person to go to their home and share the information with the parents. My school was a happy school,” Kalam said. “I don’t remember even a single drop out.”

The former President noted that 153 million children are enrolled in primary school in India but 87 million drop out before they reach the upper primary classes. Finally, only 17 million complete senior secondary school. Kalam suggested that private schools can adopt government and municipal schools and develop links to help poor students. Professionals, homemakers and senior citizens can reach out to rural areas for teaching, while corporates can also pitch in as part of their social responsibility.

“Concerted action by educationists, planners, principals, teachers, parents and students will definitely enable India to move towards knowledge economy goals within the next decade,” Kalam said before reciting a motivating poem, “I have wings, I will fly.”

The pace of the day-long conference was set by Shyama Chona, former principal of DPS R K Puram who talked about transforming classrooms by capacity building. Others who contributed to the discussion were R P Agrawal, chairperson of the Board of Governors of IIT Delhi and Shantanu Prakash, CMD, Educomp Solutions.
UGC aid to boost scientific research in varsities

Central fund to be given to eligible faculty for specialised studies

Prakash Kumar

NEW DELHI: The University Grants Commission (UGC) has offered to give financial support to newly appointed faculty in the universities and colleges to conduct scientific research, amid criticism that India lags far behind in the area of research and innovation.

A new scheme to grant Rs 6 lakh to newly appointed faculty at the level of assistant professor for conducting "basic scientific research" has been introduced by the higher education regulator here recently. The central fund, to be released by the Commission under the new scheme, will be given to the eligible faculties, "a start-up grant" for conducting their research. The scheme has been formulated by an empowered committee comprising officials from both UGC and Human Resource Development Ministry, a ministry official told Daccan Herald.

The Empowered Committee spearheading a national effort to strengthen basic scientific research in universities across the country has found it desirable to launch a scheme on research start-up grant for newly recruited faculty. The basic objective of the scheme is to promote scientific research in the country starting right from the permanent post in the faculties of basic science, engineering and technology, following the specified procedure of university will be eligible to receive financial support under the scheme, the official added.

They are required to apply within a period of six months from the date of joining the post in the department.

The Central fund will be given as a start-up grant to faculty on the basis of an expert appraisal.

Selected candidates are expected to carry out their work by themselves and not request for research fellows or project assistants.

UGC will provide Rs 6 lakh grant to the eligible assistant professor for the scheme, an assistant professor should possess PhD degree with minimum two research publications in approved or cited journals. They are required to apply within a period of six months from the date of joining the post in the department or university as per the prescribed proforma.

The empowered committee will select candidates eligible for the scheme on the basis of an expert appraisal. After clearance from the empowered committee, the grant will be utilised within two years of approval.

The grant released will have to send the utilisation certificate along with a statement of expenditure through their respective university or college.

DH News Service

Waning lab output worries PM panel

By Ayan Pramanik in Bangalore

INDIAN science is facing a crisis with declining research output and quality of expertise, top advisers to the Prime Minister on scientific matters have warned.

While Indian research output is a cause for concern, other Asian giants such as China and South Korea are surging ahead with enormous investments in science and technology, the Scientific Advisory Council to the Prime Minister has said.

The main concern for us should not be to merely improve the quantity of scientific contribution, but, more importantly, to improve the quality of science by eliminating mediocrity from our scientific and educational institutions," Professor CNR Rao, chairman of the advisory council, said.

Rao called for increasing investments in science and technology in the 12th plan period. The council has sought a total allocation of Rs 1.5 lakh crore to improve the quality of scientific research and education in the next five years.

"There is a leadership crisis wherein we don't find a sufficient number of young leaders in science. We need to take serious note of this situation," he added. "We don't mind Bachchan Tendulkar being conferred a Bharat Ratna, but Nisarg Shastri was never given one despite his contributions to the country," Rao rued.

Pointing out that India contributes only 2.5 per cent to global science and a mere 0.5 per cent to scientific research, Rao said the country must improve the quality of science by eliminating mediocrity from educational and scientific institutions. Qualitative improvement is more important than quantitative, he added.

The council has announced a set of recommendations to PM Manmohan Singh, ranging from "long-term and feasible grants for research" to sending more young people for PhD and postdoctoral studies in important areas of science and technology. It also advocates linking the IITs and IISERs with elite colleges for improvement of quality.

"While serious effort is required on part of the Centre and state governments, help from the private sector is equally essential to achieve this objective," Rao said.

Emphasising that bureaucracy in scientific administration has to be eliminated, he added: "We have to find new ways of administering science and this may require changing the structures of our institutions as well as administrative and auditing practices."

He suggested that teaching be made a national mission for the next decade because otherwise, the country would face a crisis of quality teachers.
India fares poorly in global learning study

Findings seen as a warning that India's long-term competitiveness may be in question

BY PRASHANT K. NANDA
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NEW DELHI

A global study of learning standards in 74 countries has ranked India all at the bottom, sounding a wake-up call for the country's education system. China came out on top.

It was the first time that India participated in the Programme for International Student Assessment (PISA), coordinated by the Paris-based Organisation for Economic Co-operation and Development (OECD). India's participation was in a pilot project, collated to schools from Tamil Nadu and Himachal Pradesh.

The findings are significant because they come at a time when India is making a big push in education and improving the skills of its workforce. If the results from the two states hold good for the rest of the country, India's long-term competitiveness may be in question.

Tamil Nadu and Himachal Pradesh traditionally rank high on human development parameters and are considered to be among India's more progressive states. The India Human Development Report 2011, prepared by the Institute of Applied Manpower Research (IAMR), categorized them as "median" states, putting them significantly ahead of the national average. IAMR is an autonomous arm of the Planning Commission.

For literacy, Himachal Pradesh ranked 4 and Tamil Nadu 11 in the National Family Health Survey released in 2007.

Yet, in the PISA study, Tamil Nadu ranked 72 and Himachal Pradesh 73, just ahead of Kyrgyzstan in mathematics and overall reading skills. The eastern Chinese metropolis of Shanghai topped the PISA rankings in all three categories—overall reading skills, mathematical and scientific literacy.

PISA is an international study that began in 2000. It aims to assess education systems worldwide by testing the skills and knowledge of 15-year-old students in participating economies.

To be sure, there are some reservations about the findings of the study. Such comparisons may not be as fair as they are not between equals, says Manish Sabharwal, chief executive officer of human resources training and placement firm Teamlease Services Pvt. Ltd.

Yet, he argued, it does serve as a timely warning.

"Industries are already facing a problem because of poor quality (of graduates)," Sabharwal said. "What we need to do is repair and prepare. Repair by imparting skill training and prepare by improving the school system, which is the main gateway."

In Tamil Nadu, only 17% of students were estimated to possess proficiency in reading that is at or above the baseline needed to be effective and productive in life. In Himachal Pradesh, this level is 11%.

"This compares to 81% of students performing at or above the baseline level in reading in the OECD countries, on an average," said the study.

In other words, only a little over one in six students in Tamil Nadu and nearly one in ten students in Himachal Pradesh are performing at the OECD average.

A similar trend was observed in mathematical and scientific literacy, too.

Anurag Behar, chief executive officer of the Azim Premji Foundation, said the study's findings were alarming.

This is because the PISA study found that only 12% of students in Himachal Pradesh...
Higher Education in India: Role of Private Sector

The Indian Higher Education system has grown rapidly with the number of institutions growing at a CAGR of 11% while student enrollment at a CAGR of 6.5%. The unprecedented growth in Higher Education during the past two decades has been largely due to private sector participation. This trend is particularly true in terms of enrolment in the arts and science as well as in many of the professional disciplines. Today, private higher education accounts for 43% of overall higher education and 63% of overall enrolment. Their investment in Higher Education has considerably supplemented the public investments and helped to enhance the enrolment capacity in selected disciplines as well as employment potential. In the long run, it is anticipated that the private sector investment is expected to be substantial and the proportion of private institutions in Higher Education will be much larger than at present. According to FICCI-TAXI analysis, to achieve the 30% target GER by 2020 for an inclusive growth as desired by the government, about 25 million additional seats need to be created over the next decade at an additional investment of INR 1 million crore at INR 0.4 million average investment per seat. Assuming that the private sector would continue to account for 52% of total enrolment in 2020, INR 0.52 million crore per year is an estimate required for which it is intended to provide a significant contribution.

The private sector presence in the Higher Education sector is manifesting in many different forms of colleges and universities. FICCI’s Annual Survey 2011 has identified the existing market leaders and the new entrants with emerging niche market in the Higher Education sector. The purpose is to provide a bouquet of options for private education providers to enter and grow in the higher education space while bridging the supply-demand gap.

However, unfortunately, there exists a trust deficit amongst the private sector and the government primarily due to the concern that private sector participation would raise the cost of education and thus make it unaffordable for the weaker sections of the community. To address this myth, FICCI-Synovate conducted a survey in states namely Gujarat, Uttar Pradesh, West Bengal, Jharkhand and Tamil Nadu in Tier I, II and III cities. The survey reveals that the general public feels that the new well established public institutions, private higher education institutions provide a higher value for money in comparison to public sector institutions. Further, quality and outcomes (placements) are the key criteria which private sector will continue to play an important role in offering greater access to higher education.

Internationalisation of higher education is another crucial aspect in today’s globalised world where private sector providers have been playing a crucial role. This may not be out of choice but due to competitive compulsion. Internationalisation opens up ways for healthy global competition which drives the Indian Higher Education providers to improve quality of higher education in India, both in content as well as systems and processes. Internationalisation can act as major driver to improve academic governance, pedagogy, curriculum and research in the Indian universities and higher education institutions. Several well known private players like Manipal University, Thompson University, BITS Pilani, and S. P. Jain Institute of Management and Research have taken the lead in having international collaborations with leading Universities across the globe. The collaborations span from faculty student exchange, study abroad programmes, twinning programmes to research exchange. Some private players like Manipal University, BITS Pilani and S. P. Jain Institute of Management and Research have undertaken the responsibility of showcasing the Indian Higher education to the world beyond NRI and IMI. India has immense potential to become a global hub for Higher Education given the low cost of living and a huge English speaking population base.

Finally, employability is one issue that is dependent on robust industry academia linkages which guarantees private sector (both industry and higher education institutions) partner play a significant role. The key driver of high-tech growth in knowledge, wherein wealth is created through development of innovative products. Academia being the main generator of knowledge and manpower, need to work in tandem with the industry, which puts the knowledge as well as the manpower to use. In knowledge-based economies, the industry engine runs on academic fuel, ultimately leading to happier and healthier societies. Unfortunately, India apart from the IT sector these linkages are extremely weak resulting into large number of unemployable youths graduating out of our universities. This problem areas identified include lack of soft skills, inability to solve real time problems and irrelevant curriculum. All these outcomes make the current engineering program futile for students as wells as industry, as companies end up remunerating money to training of raw materials.

FICCI has been actively working to develop National Knowledge Functional Hub (NKFH) to facilitate a meaningful engagement between engineering institutions and capital goods companies to improve the quality of students graduating from these institutions. This initiative is a “Hub-and-Spoke” model and currently FICCI is in the process of setting up a Governing Council for implementation of this initiative across regions. In 2012, FICCI proposes to set up 2 hubs in the country in collaboration with patron institutions and champion companies. This initiative will have a major snowball effect, if implemented successfully.

It is hoped that the Twelfth Plan will consolidate the reform agenda with clear guidelines & Government to facilitate inclusion and regulation that would encourage committed private sector to invest in higher education focusing on expansion and quality. The most urgent need today is implementing the pending Bills in the parliament in its true spirit in a time bound manner. FICCI urges our political leadership to pay attention to this crying need as lack of reforms in higher education is not only going to impact the economic growth but also impact the future of an entire generation of youth.

Ms Shobha Mishra Ghosh, Director, FICCI

Universities
Colleges
General courses
Professional courses
Opening new campuses
Distance education

Establishing and Growing in Indian Higher Education: Key Options for Private Players

1. Mr Montek Singh Ahluwalia, Deputy Chairman, Planning Commission, Gov giving the inaugural address
2. Release of FICCI’s E&Y Knowledge Paper - (U.K.) Prof David Naylor, President, University of Toronto, Canada, Prof. R. Manakrishniah, Chairman, FICCI Higher Education Committee & Chairman, BOS (IIT) Kenacw; Mr Michael Rouse, International Director, Parliament, Scottish Cabinet Secretary for Education and Lifelong Learning, Mr Monkey Singh Ahluwalia, Deputy Chairman, Planning Commission, Gov, Mr Harsh Vardhan, President FICCI, Dr Lin Hongming, Deputy Minister, Ministry of Education, Taiwan; Dr Daniel C Levy, Distinguished Professor, University at Albany (SUNY) and Director: PROPHÉ, Prof. Raja Saxena, Co-Chair FICCI Higher Education Committee & Vice-Chancellor NMIMS University
3. Mr Harsh Vardhan, President, FICCI giving the Welcome Address at the Inaugural Session
4. Mr Sam Prida, Adviser to the Prime Minister of Public Instructions, Infrastructure and Innovation addressing the Delegates at the Summit
MIT to offer free online diplomas

JUSTIN POPE
lettershindustanitimes.com

MASSACHUSETTS: Think you can hack it at MIT? If so, the world-renowned university is willing to give you a new kind of credential to prove it. Not a full-fledged diploma "C" that's still a possibility only for the 10,000 or so students admitted to its Cambridge, Massachusetts, campus. But on Monday, MIT is announcing that for the first time it will offer credentials "C" under the name “MITx” "C" to students who complete the online version of certain courses, starting with a pilot program this spring. "This is not MIT light. This is not an easier version of MIT," said Provost L. Rafael Reif. "An MITx learner, anywhere they are, for them to earn a credential they have to demonstrate mastery of the subject just like an MIT student does." The announcement comes as elite universities like Stanford, Yale and Carnegie-Mellon are experimenting with how to use the Internet to extend their teaching to a global audience hungry for instruction on platforms like YouTube, Apple's iTunes U and others developed by universities themselves. MIT's OpenCourseWare has been among the most popular, making course materials such as syllabi, tests and lecture videos from over 2,000 MIT classes available free online. The 10-year-old program has been accessed by more than 100 million people worldwide. But where elite universities like MIT have mostly stopped short is offering some kind of credential that carries the university name and proves the recipient has mastered the curriculum.

Economic Times, ND 20/12/2011

New XAT to go Beyond Formulae

XLRI to reduce difficulty levels and cut-offs to attract a good mix of students

After CAT, XAT is the most awaited B-school entrance exam — its scores are accepted by more than a 100 institutes in the country. XLRI School of Business & Human Resources, Jamshedpur, which conducts XAT in January every year, plans to restructure the exam next month. It will move from being a formula-based approach to a commonsensical one. XLRI also plans to reduce the XAT score cut-offs for interviews. The institute's admission chairperson and faculty member Soumendra Nath Bagchi spoke to Writtakar Mukherjee on all this and more.

THE NEW STRUCTURE
Apart from being extremely doable, this year's XAT stresses more on a commonsensical approach rather than a pure formula-based one. The restructuring has been done to ensure a level-playing field, not only for non-engineers, but also for steady performers.

THE REASON
In the existing format, a majority of the tougher questions remain unanswered. It did not solve the purpose of testing students. Students who answered just a few questions have been getting admission into different institutes, which might not be the kind of students the institute is looking for. Hence, to have a higher attempt rate, we are going in for a reduced difficulty level. However, there will be uniqueness and surprises in the pattern of questions. Further, we have been observing that engineers and candidates from a science background, who end up as high scorers in XAT, often do so by virtue of their quantitative orientation during graduation, and may not score high in group discussions and personal interviews. After all, around 85% of the applicants are from an engineering background.

NEW CUT-OFF
XLRI has decided to reduce cut-offs from the the 90s to the 80s to attract a good mix of students. We experimented with reduced percentile cut-offs for calling candidates to the group discussion and personal interview last year. Its success in getting a diverse pool of applicants, in terms of geography and work experience, has been encouraging.

NO DIGITAL EDGE YET
XLRI plans to continue with the paper-pen format. We believe that for students choosing to study in XLRI, this is the best format for the exam. The paper-based exam allows us to audit the question paper, individual questions or answer sheets at any time we want. XAT allows an equal-playing field for people who are not familiar with computer usage and those who are.

Candidates come from diverse educational and financial backgrounds. XLRI believes that one's familiarity with a computer can make a significant impact on candidates' response to questions. Moreover, systems-related problems such as slow computer terminals are eliminated to a large extent.
Ramjas 3rd yr students may face probe
First Yr Students Faked CBSE Marksheets

Manoj Prodran Gohain | 11am

New Delhi: The fake mark-sheets and provisional certificates used for admission to Ramjas College are imitations of those awarded by the Central Board of Secondary Education. The college administration claims the certificates submitted by the first-year students from other boards are in order but it is yet to verify the certificates of second-year students coming from other boards.

So far, 20 first-year students and five second-year students are found to have been admitted on the basis of forged mark-sheets and fake provisional certificates in the 2010-11 and 2011-12 sessions. Also, more cases of fake admissions may come to light if the mark-sheets and certificates of the third-year students are verified too.

"For examining the third-year students' documents, we have to get the approval of the staff council and I am going to place this in our next meeting," said principal Rajendra Prasad.

"All those cases of fake admission used the CBSE mark-sheet pattern. We have not come across fake mark-sheets of any other boards so far. The team of forensic experts visited the college two days ago to examine the rest of the documents. But we have not yet examined the documents of the second-year students who are from other boards," said Prasad.

Two groups ran Ramjas admission racket: Cops

Neeraj Chauhan | 11am

New Delhi: The admission racket at Ramjas College was run by two separate groups, the police claimed on Tuesday. They alleged Anurag Sharma, who is on the run, was known to the arrested suspects, Nareen Tau and Suresh Chand, but worked independently. Sharma, alias Pandit, is reportedly a Ramjas alumnus.

The police have so far confirmed the role of Tau's gang in at least 20 fake admissions at the college, and suspect Sharma's hand in six others.

"So far, we have found out that Sharma and Tau knew each other but did business separately," said a police source. Initially, Sharma was believed to be part of Tau's gang.

Police said most of the college administration committee's 23 members have been questioned about the admission process. Admissions were cleared on the basis of references given by botany lab assistant Suresh Chand, they said, adding, he was paid Rs 50,000-50,000 for every admission.

Police still believe the racket was run by insiders. A source said, "If Anurag was on his own, it is possible that more college staff was involved." Nine persons have been arrested so far in the case, including 'kingpins' Tau and Chand, and 29 fake records have been registered.

The police, however, have reportedly not recovered any money from the accused persons so far, notwithstanding the accusations of their charging large sums to get the admissions. When asked whether the first-year students who have been charged with forgery will be arrested as well, a police officer said, "We will take a call on that later." - neeraj.chauhan@thehindu.com

College blames ‘unprecedented rush’ for admission scam

Staff association, University authorities, however, not buying the explanation

Staff Reporter

New Delhi: Ramjas College authorities have attributed their failure to properly screen mark-sheets, which eventually led to the fake admission racket, to an "unprecedented rush" during admissions which in turn made the screening process practically impossible for the administration.

College Principal Dr. Rajendra Prasad, who convened a press conference here on Monday, distributed thick booklets containing university circulars and college admission guidelines to minutes of meetings held by the college's staff council and the cut-off lists.

"I want to remove certain misunderstandings that have cropped up during this entire episode," he said, before proceeding to read from the booklet technical details of the admission procedure.

"We are also looking into the mark-sheets of second year students again and we might even check the third year's," he said when asked whether he had followed due procedure last year.

The Principal also stated that the police was conducting the investigations in a "fair and speedy manner" and that they had "apologised" for their formerly aggressive behaviour during the initial stages of investigation.

His explanations were, however, not accepted by the college staff association who alleged that there was something inherently wrong with the administration.

Not informed

"We categorically state that we were not informed by the administration that they will not be cross-checking CDs this year," said the Association secretary Vikas Verma, adding that the Ramjas administration had not admitted genuine students who were waiting for their Class X mark-sheets.

"Other colleges took an undertaking from these students to submit their mark-sheets within 10 days, but this college, which did not even allow such students, managed to allow so many fakers.

Association president Dr. S. K. Jha said: "There was a similar scam which was unearthed in 2005 where five admissions were cancelled and a similar internal committee was formed to prevent such acts in future, but we are yet to see any report from the committee."

University authorities are also not buying Dr. Prasad's explanation.

"This has been happening in Ramjas for some time," said university sources.

Dr. Prasad was questioned by the police about three days ago when he complained that he was being victimised.
Japan funds for Metro Phase III to come in Jan

Rumu Banerjee | TNN

New Delhi: Delhi Metro's Japanese connection will be getting a boost, come January. As work on the third phase of the network gathers steam, the Japan International Cooperation Agency (JICA) will be releasing the first installment of its loan for the Delhi Metro network next month. Pegged at 53 percent, the loan from JICA for the Rs 35,242 crore project will form the bulk of funding for Phase III, said sources. It will be used to bankroll the civil work, source rolling stock as well as for acquiring the brand-new signaling system for this phase.

A senior official said: "The coming through of the first installment means that the pace of work on the third phase can now be increased. Since JICA loan is 53% of the entire project, it plays an important role in the project planning." The good news for the Delhi Metro Rail Corporation (DMRC) is that with the Central and Delhi governments pitching in with another 21.27%, the onus for getting the rest of the project cost, which is with the DMRC, is not very much.

A source said: "Delhi Metro can raise the rest of the amount, which is not much considering a substantial 70% has already been raised by JICA and the government." The first installment of the 53 percent loan is around Rs 6,900 crore, said officials.

On ground, the coming through of the loan is the signal for Delhi Metro to ramp up its tendering process. The tenders, which are built on JICA funds, need to be vetted by the Japanese agency before they can be awarded. This process has already gotten off the ground, said sources. "The funding will also be used to source rolling stock for the Phase III as well as for the state-of-the-art signaling system that will be introduced in this phase," added the official.

JICA has so far paid over Rs 16,000 crore for phases I and II. DMRC has paid back a part of the loan for Phase I amounting to Rs 129.55 crore. The interest for the loan amount for both phases have been repaid to the tune of Rs 696.96 crore.

NEW YEAR GIFT: JICA will shoulder the bulk of funding for Phase III

Staff to go to Tokyo varsity

It is not only Japanese funds driving the Delhi Metro, it's also Japanese technology. DMRC has started sponsoring its employees for higher studies in Metro technology at the University of Tokyo. Set to be implemented from 2012, the two-year programme will introduce Delhi Metro assistant managers and managers to Japanese expertise in Metro and its advancements in the field of civil engineering, electrical and electronics engineering. They will also be sent to Japan to learn high speed technology. Delhi Metro already has a course in IIT Delhi for Metro Technology and a training institute in Shastri Park.

TNN
Hindustan Times

Title: 6 LASHKAR MEMBERS GET LIFE SENTENCE
Author:
Location: BANGALORE
Article Date: 12/20/2011

**6 LASHKAR MEMBERS GET LIFE SENTENCE**

**BANGALORE:** Six persons suspected to be part of a Lashkar-e-Taiba terror module were sentenced to life imprisonment on Monday by a local court on the charge of waging a war against the nation. Their LeT links came to light during investigation into the 2005 attack on Indian Institute of Science here, in which a retired Professor of Delhi IIT M C Puri was killed. During questioning, it was found they had played no role in the IISc attack, but had stored explosives for other terror attacks.

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**LONDON, PTI:** Believe it or not, scientists have developed a superfast camera, the size of a dustbin, which can capture the speed of light.

- A team at the Massachusetts Institute of Technology (MIT) claims its superfast camera can show a bullet-shaped pulse of light travelling from one end of a laboratory flask to another in a fraction of a second, the British media said.

- The scientists, however, say that it will be some time before the camera is commercially available.

- Prof Ramesh Raskar at the MIT Media Lab told "The Sunday Times": "With our ultra-fast imaging we can actually analyse how the photons are travelling through the world."

- The camera can also create 3D images because it is capable of "seeing" photons of light even inside objects, say the scientists.

- The device was made by adapting a "streaker tube"—used by chemists to scan and capture light. It can record the progress of light pulses through a flask of liquid. Each still picture had a shutter speed of 1.7 picoseconds—a trillionth of a second.

- Raskar added: "Watching this it looks like light in slow motion. It is so slow you can see the light itself move across the distance. This is the speed of light captured: there is nothing in the universe that moves faster, so we are at the physical limit of high-speed photography."