[Panel Session]

Education For The Better World

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New information age and human capital development

The transition from the agricultural or industrial age to information age is happening around the world in the societies we live in. However the world is also seeing new emerging issues putting new pressure on societies. Some of the most pressing problems of our times like persistent poverty & unemployment, HIV/AIDS, food security, energy shortage, global warming, environmental degradation, rising cost of healthcare etc. are now becoming key priorities for the societies. The younger generation which are global citizens of tomorrow have to be better prepared for handling these issues of today & tomorrow, otherwise they will be left with an increasingly complex world with problems created by us for pursuing developmental needs of today but compromising the needs of the future.

Similarly the world is facing new divides more than ever. Be it digital divide, demographic divide or skill divide, the impact on the society is immense and nation's ability to respond to it and create long term strategic advantages is more critical than ever, given the world is seeing shift towards globalized knowledge driven economy from natural resources driven economy.

And in that context, human capital development is one of the top strategic priorities most nations are seeking. Governments, policy makers, civil societies, businesses, academia and society in large look at arriving newer & better ways of preparing younger generation as learning generation who can learn, unlearn & relearn faster to address their own long term socio economic developmental needs. More so in developing nations, this is the opportunity to leapfrog and accelerate development with right structures & policies as they have higher demographic dividends and bigger, deeper canvas to innovate for its own developmental needs. Also with advents of technology and globalization in 21st century information age that provides level playing field to all, the opportunity to change is here & now for developing countries.

The mismatch between 21st century globalized world & current education

However the fact remains that though the way we live, work & play has changed so much in last a few years, but the way we learn has not. Every aspect of 21st century society is being transformed by Information & Communication Technologies (ICT): the economy, the workplace, the home, commerce, government, the health sector but the education sector still operate based on the needs of the industrial society. This misalignment between schools and society takes the form of discrepancy between what and how we teach students in schools and how schools are organized and operated. Be it new age aspirations or 21st century career readiness, current education system is often not adequately equipped to provide the skills necessary to fulfill these goals. Similarly the world requires very diverse workforce now compared to industrial age due to emerging shifts in the way big problems are getting solved with the advent of technology. As an example, with world population poised to touch 9 billion in a few years from now, smart living needs are becoming critical and though many countries have huge unemployment, construction sector worldwide (which is often a big economic driver in any nation) is struggling to attract talent to meet the need of diverse professionals for smart home sales, insurance planners, designers, architects, energy experts, construction engineers, etc. Thus the gap in employment needs of the world against the available employability ecosystem (education system of schools, colleges etc.) is widening, thus hurting socio economic development agendas of the nations. This coupled with demographic shifts in developing countries with younger population base, is making job creation and job readiness as the biggest socio political agendas everywhere. Conversely, in nations that are seeing demographic decline, increasing job productivity through innovation

is the key, and making education system ready for that is critical. In both the cases, education system reform is critical for their human capital growth needs due to change in the skill equation & its impact on socio economic growth of the nations.

With advent of ICT in the information age, this problem is taking an entirely new dimension. First, jobs of the future are not even created yet. With rapid pace of technology & globalization, in the contemporary workplace, people work in teams across the boundaries of time and space and use a variety of social, digital and physical resources to solve complex problems and create new ideas, products and services. They use ICT to collaborate and share resources, ideas and products with colleagues, customers, or a larger audience or markets to make use of the knowledge they create in meaningful ways. Today's fast jobs that are growing didn't even exist five to ten years ago. App developer, Social media manager or Sustainability manager are a few examples of new high in-demand jobs that were not existing earlier. And that trend will continue in the future as well. Mckinsey Global institute estimates that by 2020, there will be a global shortfall of 85 million high and middle skilled workers worldwide as this paradigm of new job sector continues to accelerate due to new technologies, new applications that touches everyone's lives.

Second and at more fundamental level, the demands for skills desired in today's workforce are changing. A study conducted by Levy and Murnane concluded that in US economy, jobs requiring routine manual and cognitive skills as well as non-routine manual skills actually declined over the period of last five decades and only the jobs that require non routine analytical skills have shown consistent growth. Now that poses a big question to existing education systems and a dilemma to schools. The skills that are the easiest to teach and test are also ones that are easiest to digitize, automate and outsources and hence the decline in the jobs requiring those skills. So what role schools of information age should play, how they teach skills that are essential for success in new knowledge era, what are these skills, how do we measure these skills etc., these are some of the new questions being asked and discussed at every level of society given globalization and ICT will continue to accelerate this dilemma. The most education systems around the world still engage in traditional practices that require students to work individually, as they recall facts or perform simple procedures in response to pre-formulated problems, without the aid of books, computers, social networks, or other resources. So in order to prepare students for 21st century challenges and opportunities, significant reform is needed in education systems and innovation has to be brought in every aspect of schooling : who goes to school & how, what is learned and how it is learned, how learning is assessed, and how schools are organized. It is no more question of just conventional access and conventional teaching learning quality improvement or pedagogy improvement but a whole new way of incorporating new skills and innovation agenda in education reforms worldwide to address challenges posed by globalization and advent of technologies in information & knowledge era ahead of us.

Business, academia and researcher community broadly call these essential skills which workforce of today & tomorrow needs as 21st century skills. The skills that are essential for success of young generation in globalized world moving towards knowledge economy consist of skills like communication skills, problem solving skills, collaboration & team working skills, critical thinking or analytical skills, Information literacy skills. These skills though in itself are not new but carry in a meaning in ICT driven information age as it helps learners to be better prepared to handle the current & future challenges in front of us. It provides foundation to think & act differently by making more sense of information available, create new knowledge collaboratively and apply for real world use and prepare them to be productive in workforce as they simulate real work like environments in classrooms. Also students learn much more in informal learning settings than in formal classroom given the time they spend outside classrooms in their waking hours every day and given the new learning platforms they experience through games, TV, other media etc. outside of formal learning settings. And this is becoming true for developing countries as well as advanced countries. Hence it becomes critical to provide lifelong anytime anywhere anyplace seamless 21st century skills learning environment for learners of new generation. This generation, which is growing up in a technology abundant world, is called as EPIC generation by Futurist Dr. Leonard Sweet because they are Experiential, Participatory, Image Rich and Connected. They demand new modern

learning paradigm, a new learner centered education system where each individual student is treated as a student with special need – a system of education which accommodates instruction for all, not enforcing one size fits all. This system of modern learning paradigm makes every student a social learner who is self-directed and who is always inquiry driven (ready to move from known side of knowledge acquisition to unknown side of knowledge exploration & creation). The current conventional classroom design doesn't often provide this new paradigm and hence we need to shift our mindset for instruction & assessment to learner centered instruction & learner centered assessment. The educators need to ask themselves: what are the new methods of instructions and assessment in learner centered education, what does learner centered education look like in the information age, and what should we do to incorporate essential 21st century skills in teaching learning processes.

These major changes in instruction and assessment require a substantial change in roles of students, teachers and parents in learning process. In the heart of 21st century learning that is enquiry driven & always engaged, is self-directed and active students. Starting from planning to completion of learning projects, they are the owners of the learning process. Aligned with this role, teachers are involved in providing necessary support that each individual student needs. Teachers role become more critical than ever as they provide not just academic support but also emotional & psychosocial support. Parents provide additional guidance to their children and teachers seek opportunities to involve parents in supporting learning process to provide more guidance to learners and build closer relationship. This student centered learning require changes in current education system structures. And given the universal need of this, given globalization & information age we living in, developing such system should be topmost human capital development strategy priority for the nations.

Technology led education transformations can give global competitiveness

For creating a new education learning paradigm and enabling human capital development, ICT can be a great enabler as well as catalyst for transformation or change agent. When we look at building new education systems for individual learners to help choose their learning outcomes, select media & strategies to use as vehicles to attain those outcomes at their own pace, it is impossible for teachers to enable such environment with differentiated instructions and assessments without effective integration of technology to cater the needs of students, teachers, administrators etc. Also technology alone can't fix bad education model, that's why we must always think about how technology can be used to transform learning. 21st century skills education in every teaching learning process using technology offers that opportunity as it helps teacher's implements new methods of instructions and assessment aligned to needs of the society. New models of technology based transformations like gamification, blending of formal & informal learning, shifts to virtual or hybrid models, personalization of learning & assessment, collaborative classroom management are some emerging examples that are based on new technology trends like mobility, cloud services, consumerisation etc. Developing countries can use some of these models to leapfrog from older challenges of education of industrial era to cater to needs of knowledge society building. Now is the time for every developing nation to take advantage of technology based education transformations to be a Learning Nation, possible through innovations in education and with help of ubiquitous cost effective technologies. By providing 21st century skills to its citizens, the nation can reap multiple benefits that can provide global competitiveness like enhanced talent pool, stronger economies, innovation driven efficiencies and technical leadership worldwide.

Intel and 21st century education transformation

Intel believes it has a large role to play in preparing students for success. Intel Education's mission is to advance excellence in education worldwide. And Intel vision is to create and extend computing technology to enrich the lives of every student on earth this decade. Intel believes its aspirational vision is achievable based on its longstanding commitment to education. Intel has worked with educators and governments to transform education in 100 plus countries. That work includes more than 150M students who have used Intel architecture solutions for learning and helping more than 10M teachers with professional development that helps them integrate technology effectively in their classrooms and develop 21st skills in

their students. Around the world more than 7M students participate in Intel International Science & Engineering Fair (Intel ISEF) affiliated local fairs annually. And Intel employees also get involved supporting education. They have volunteered more than 4M hours in local schools. Intel has invested $1B in the last decade for education improvements worldwide with $100M annual investment. The quality of education impacts everyone: students, employers, communities, and societies. So when Intel prepares students to accomplish more, Intel also inspire them to tackle local and global challenges. That contributes to a better workforce, expands innovation, creates opportunities for growth, and builds stronger communities. Intel knows that a comprehensive approach is necessary to transform education. Through its long-standing dedication to education, Intel is delivering fresh insights, unique programs, and holistic solutions to help educators, government officials, IT professionals, and other leaders inspire excellence in students worldwide.

One of the biggest investment Intel has done is in area of teacher professional development. We all know that quality of education can't exceed quality of its educators. Intel empowers educators to integrate technology that engages students in learning and prepare them with critical 21st century skills for success in the global economy. Its flagship program, Intel® Teach program provides flexibility through delivery options (face-to-face, online, or hybrid courses) and a range of course content levels (beginning through advanced experience). All courses enable teachers to introduce, expand, and support 21st century learning in any subject using their existing curricula. It has vast IP in multiple languages worldwide for teachers to learn more and more on how to effectively integrate & use technologies for their student success in their teaching learning process. Intel has trained more than 10 million teachers, student teachers and teacher educators worldwide using this program and it's scaled in developed as developing countries in collaboration with local government or partner. It has resulted in changing countless students' lives who have been benefitted with more educated teachers who knows how to integrate 21st century skills in education. Intel also works with governments and partners for helping them build holistic solution as per their key priorities. Intel understands that education technology requires more than great technology devices and it brings together whole ecosystem of product, software, local content and implementation support services together as per local needs to drive classroom transformation. Intel proactively also shares its knowledge of what works & doesn't work, and various system reform models through various policy networking forums & channels so that education system designers are in best position to learn from each other while addressing their 21st century education needs.

Key issues and key learnings with respect to globalization of education
There are growing research backed evidences that technology can be key enabler for transforming teaching learning towards modern student centered 21st century skills integrated education system aligned to global needs. This change requires strong leadership support as well as role model or champion for any initiative to start, scale, sustain & eventually systemize. Some key aspects to incorporate in this journey of transformation (i) Stakeholder and change management is very critical as age old teaching practices don't change overnight. Sustained professional development is the key (ii) No one size fits all – every education system requires its unique approach for start – scale-sustain – systemize (iii) Given increased globalization, policy makers have to pay attention to new emerging issues like education data governance, innovation policy, responsible & safe ICT usage (iv) PPP partnership models need to be continuously redefined to take advantage of all the global knowledge & competencies available from all stakeholders. These are also some of the areas worth exploring for more future prospects of international cooperation.

It's time that nations collaborate with each other in new ways, form new partnerships, build new approaches for education transformation to enrich the lives of students around the world. And Intel remains committed as a trusted partner, with its education transformation efforts worldwide, to help countries achieve their own human capital development goal for success of their citizens in this complex 21st century world.

Slide 1

Education For The Better World

Japan Education Forum XI
Impact & Challenges of Globalization
concerning Education in Developing Countries

Anshul Sonak
Regional Education Director (Asia Pacific)
Corporate Affairs Group, Intel Corporation

Slide 2

Legal Disclaimer

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Slide 3

World Is Becoming Increasingly Complex...

Big Global Challenges Ahead of us

Water

Healthcare

Education Access

Climate Change

Slide 4

World Seeing New Divides…

Example of Digital Divide

facebook

+ Demographic divide
+ Innovation demand – supply divide

Slide 5

New Aspirations In The World..
Fullfilling dreams and building diverse careers

A young boy in Singapore wants to become Nursing Assitant. He is passionate about helping old aged people in his community as he has seen sufferings

Young girls of India having aspirations of using robotics for solving world food chain inefficiencies and building smart agriculture practices

New age aspirations & career readiness – are our schools and colleges ready for that?

Slide 6

Diverse Workforce Needs Of The World
Emerging employability agenda for socio economic growth

Dubai (UAE) wants to position itself as Tourism hub of the world given geographical center. And working to attract, prepare > 1million people to be employed directly or indirectly in whole tourism sector

With population poised to be 9 billion & having smart living needs, construction sector struggling to attract talent to meet the need of diverse professionals of, sales, insurance, planners, designers, architects, energy expert, construction engineers, labors etc

Job creation & preparedness is the biggest socio political agenda : Is current education and employability ecosystem ready for that?

The Jobs Of The Future Have Not Been Created

FAST JOBS GROWING THAT DIDN'T EXIST
10 YEARS AGO:

App Developer

Elder care services coordinator

Social Media Manager

Sustainability Manager

User Experience Manager

Energy Auditor

Fuel cell engineer

Bio-informatician

Biomass plant technicians

McKinsey Global Institute estimates that by 2020 there will be a global shortfall of 85 million high- and middle-skilled workers.
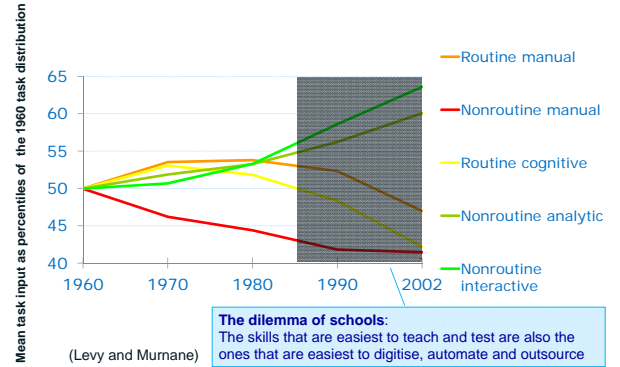
Source: Education to Employment, McKinsey 2012

How The Demand For Skills Has Changed
Economy-wide measures of routine and non-routine task input (US)

Mean task input as percentiles of the 1960 task distribution

- Routine manual
- Nonroutine manual
- Routine cognitive
- Nonroutine analytic
- Nonroutine interactive

(Levy and Murnane)

The dilemma of schools:
The skills that are easiest to teach and test are also the ones that are easiest to digitise, automate and outsource

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Is Current Education Ready As Engine Of Innovation?

It is not just about access and quality any more..

Skills: New Currency For Success In New World

21st Century Skills

These are the students will need be prepared for future and tackle grand challenges are before us.
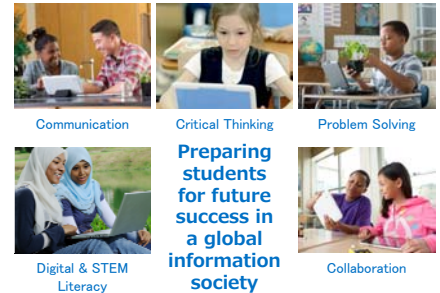
Preparing students for future success in a global information society

Communication

Critical Thinking

Problem Solving

Digital & STEM Literacy

Collaboration

Where Do Students Learn Today..

LIFELONG AND LIFEWIDE LEARNING

9.25%

16 WAKING HOURS

0-5   K   GRADES 1-12   UG GRAD   WORK   RETIREMENT

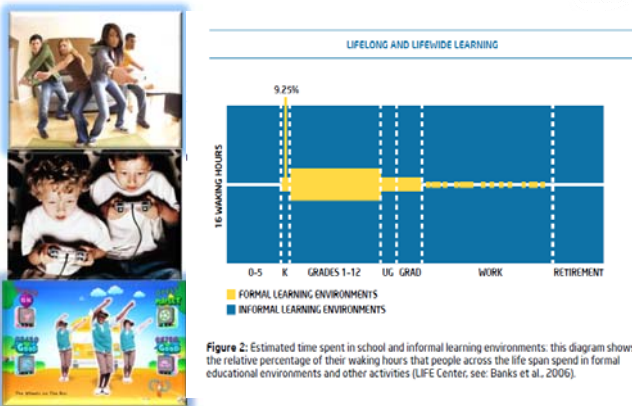FORMAL LEARNING ENVIRONMENTS
INFORMAL LEARNING ENVIRONMENTS

Figure 2: Estimated time spent in school and informal learning environments: this diagram shows the relative percentage of their waking hours that people across the life span spend in formal educational environments and other activities (LIFE Center. see: Banks et al., 2006).

21st Century Learners – EPIC Generation

Futurist Dr. Leonard Sweet describes learners grown up in a technology abundant world as "EPIC" generation

- E – Experiential   I want more than a lecture. I want an experience that provokes and incentivizes me

- P – Participatory   I want to participate in the outcomes of the program. I want to upload my thoughts

- I – Image Rich   I want a picture to engage me, help me explore new perspectives and retain ideas

- C- Connected   I want to interact with others socially on the issues in person & through technology

The Shifts In The Modern Learning Paradigm….

The Social Learner

…moving from Me to We

Self-directed

…moving from Dependency to Autonomy

Inquiry-based

…moving from the Known to the Unknown

Technology In Education – Tipping Point For Change

Some key trends already visible in education systems

Emphasis on Collaboration

Emphasis on 21st Century Skills

Challenge - based Active learning

- Social Learning platforms / communities
- P2P Platforms for teachers
- Classroom Management

- Gamification
- Augmented Reality
- 3D Printing
- Sensors/Gesture
- Wearable Computing

Digitization

Cloud Services   Mobility

Consumerization

Green: within 1 year
Orange: 2 to 3 years
Purple: 4 to 5 years

Personalized 1:1 Adaptive / Self Paced / Real-Time Assessment

Blending of formal and informal learning

- Big Data
- Adaptive Learning Platforms
- Smart School

- Open Content
- Automatic Tutoring
- Online Tutoring

Shift to virtual / hybrid models

- MOOCS
- E-Learning
- LMSs

Source: K12&Higher Ed Horizon report, Education Market Map, Futuresource UNESCO, EMPG Q3 2012 Competitive update, Edsurge….

Every Nation Can Be A Learning Nation In 21st Century
Through Innovations in Education & with help of ubiquitous technologies
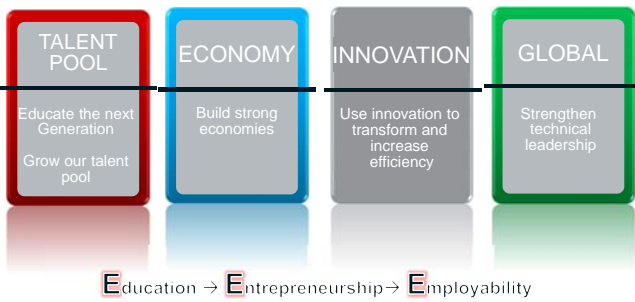
TALENT POOL

Educate the next Generation

Grow our talent pool

ECONOMY

Build strong economies

INNOVATION

Use innovation to transform and increase efficiency

GLOBAL

Strengthen technical leadership

Education → Entrepreneurship → Employability

So What Is Intel Doing?
Mission : Advance excellence in education worldwide.

intel
Education

Vision: This decade we will create and extend computing technology to connect and enrich the lives of _every student_ on earth.

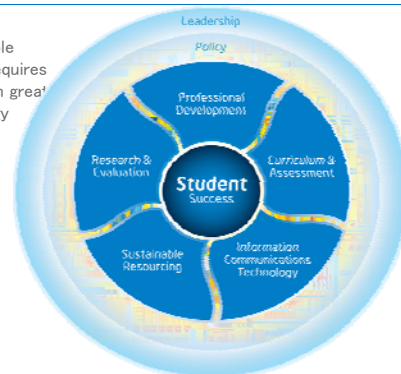## Intel's Commitment To Education

intel
Education

150M students have used Intel solutions for learning

Transforming education in 100 countries

Professional development for 12M teachers

300 + Education Programs worldwide

7M students in Intel Intl. Science & Engineering Fair affiliated fairs

4M employee volunteer hours for education

$1B invested in the last decade

Transforming Education For Student Success

Sustainable change requires more than great technology

Leadership
Policy
Professional Development
Research & Evaluation
Curriculum & Assessment
Student Success
Sustainable Resourcing
Information Communications Technology

intel's approach to helping governments and educators is comprehensive and focused on student success

By Providing Sustained Teacher Professional Development
Across inservice & preservice sector in 70+ countries

The Best Teachers Never Stop Learning

Intel Teacher Professional Development Offerings

- Intel® Teach
- Intel® Transforming Learning
- Intel Teachers Engage Community
- 21st Century Teaching Resources

Intel empowers educators to integrate technology that engages students in learning and prepare them with critical skills for success in the global economy.

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Intel® Teach Program Portfolio:
All courses enable teachers to support 21st century learning in any subject, using their existing curricula.

Intel® Teach Elements Courses - www.intel.com/teachers
A series of visually compelling eLearning courses for K-12 Educators of all subjects

Assessment in 21st Century Classrooms	Collaboration in the Digital Classroom	Designing Blended Learning	Inquiry in the Science Classroom	Project-Based Approaches	Thinking Critically with Data	Leadership in the 21st Century
Teachers learn to develop student-centered assessment for improved learning.	Helps **Teachers** prepare students for the globally connect world.	**Teachers** transition to blended learning experiences.	**Teachers** explore ways to develop students' scientific thinking and practices.	**Teachers** improve their application of PBA to engage students.	**Teachers** teach students to think critically about information around them.	**Educators** explore school leadership in students' technological world.

Download a brochure >

Intel® Teach Courses –
Substantive, research-proven courses delivered through a "train the trainer" model

Skills for Success	Getting Started	Essentials Course	Advanced Online	Thinking with Technology	Leadership Forum
ICT Teachers train to use student curriculum that develops digital literacy, problem solving, critical thinking, and collaboration skills.	**K-12 teachers** are introduced to classroom software productivity tools and student-centered approaches to learning.	**In-service and Pre-service teachers** develop units that integrate technology into existing classroom curricula to promote student-centered learning. Face-to-face or hybrid face-to-face and online.	**K-12 teachers** build communities to advance their integration of technology and 21st century learning.	**K-12 teachers** develop project-based units using free online *thinking tools* to enhance students' higher-order thinking skills.	**Education Leaders** focus on supporting and implementing effective technology integration in school.

+ Intel Engage Community and Free Educator Resources

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Trained > 10 Million Teachers In 70+ Countries!
Enabling good education – changing countless lives

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By Helping Governments & Partners Build Holistic Solutions
Education Technology Requires More than Great Devices

FLEXIBLE, HOLISTIC EDUCATION TECHNOLOGY SOLUTION

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Globalization & International Cooperation - Some Key Learnings

Start ➡ Scale ➡ Sustain ➡ Systemize

- Technology is revolutionary while educators are evolutionary
- No "One size fit all" for education system change:
  - Accessible, Affordable, Attractive and Applicable – no one single magical formula
  - Impact measurement moving towards Leaning Gains and Outcomes
- Reinventing new learning spaces need new policy conversations –
  - Education data standards, innovation policy
  - Responsible & safe usage of ICT
- Partnership models (PPP) need to be continuously redefined
  - Academia, Civil Society, Business, Governments as conventional stakeholders
  - Parents and students as emerging critical stakeholders

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Together we can enrich the lives of students around the world

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