

Emerging Technologies and The Future of Education

Dr. YSR's Legacy: Rajiv Gandhi University of Knowledge Technologies

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RGUKT Origins

- Honored to be present in 2008, when Dr. YSR announced the creation of a RGUKT
 - to benefit the gifted rural youth
 - in the form of three IIITs
 - in the three regions of undivided Andhra Pradesh.
- He felt identifying and providing full scholarship to the top 1% of the rural youth will yield enormous future dividends

RGUKT Vision and Mission

RGUKT

- Provides a 6-year integrated program,
- With free food, accommodation, tuition, and uniforms.
- Admission based on selecting the Mandal Best
 - While following the reservation norms, and
 - Ensuring Geographic Equity.
- Free laptops and internet connection ensured that remote instruction with lecturers at a distance.
- Selecting the top students after the 10th class resulted in more than half girl students.
- **Dr. YSR's Vision was Revolutionary Then and Even Today.**

Rationale: Problems Facing Rural Youth in AP

- Rural youth cannot successfully compete in National Exams
 - Most rural kids can't afford to go to coaching centers
- Rural Parents do not know options available for their kids
- Can't commute and can't afford Hostel Fees
- Quality Teachers not available

The RGUKT Solution

- Rural youth cannot successfully compete in National Exams
 - *Direct admission after 10th grade – no SAT like national comparison*
 - *Local Best Model within each school using SSC 10th results*
 - *UC system 4% of top student admission*
- Rural Parents do not know of the opportunities available for their kids
 - *Admission by Invitation not by Application*
- Can't commute and can't afford
 - *Fully Subsidized Residential Program*
- Quality teachers not available
 - *Online Remote Learning*

Learning Process at RGUKT

- eLectures
 - Professors are responsible content creation and introductory videos for problem solving sessions
 - Mentors (junior faculty) and Teaching Assistants proctor the learning sessions
 - Distance Learning
 - Asynchronous tutored video
 - Random access
- eLaboratories
 - Simulated Environments
- eLibraries
 - Digital Libraries
 - Million Book Project – www.ulib.org

RGUKT Uses Latest Advances in Learning Sciences

- Learning to Learn
 - Read the chapter and answer questions at the end of chapter
- Learning by Example
 - Simon's China Experiment
- Learning by Doing
 - Practice Makes Perfect
- Just-in-Time Learning
 - Learning from Errors
 - Error Correction and Debugging
- Self-Paced Learning
 - Variable Duration Learning

Implications of Emerging Technologies to National Education Policy (NEP) 2020

NEP2020: Significant Improvement Over Status Quo

Vision: **Equitable** and **Vibrant, Knowledge** Society with **Quality** Education for **All** with 50% increase in the Education Budget

School Education

- 5+3+3+3 Model
- Exams: No exams except 3,5, and 8
 - 10 and 12 Board Exams limit of 2 times
- Interdisciplinary Curriculum
- Coding
- Midday Meal Scheme

Higher (Post-Secondary) Education

- One Year Certificate, Two Year Diploma, Three Year BA, and Four Year BTech

Other

- Special Education Zones
- Gender Equity

NEP2020 Must Be Re-Envisioned in Light of the COVID-19 Pandemic

New NEP?: Education in the World of Online and Remote Learning School Education

- 5+3+3+3 Model: **Flexible Curriculum for Self Paced Learning**
- Exams: **No exams except 3,5, and 8 to Rishi Valley Model**
- Interdisciplinary Curriculum: **Self Paced Curriculum**
- Coding: **Can Start in Primary School instead of 6 Grade**
 - Xprize Learning Challenge \$10 Million won in 2019
- Midday Meal Scheme: **Breakfast and Lunch? 730AM and 1230PM**

Higher (Post-Secondary) Education

- 4 Year: One-Year Certificate, Two-Year Diploma, Three-Year BA, and Four-Year BTech to **KG to PG Online College in Every Village**

Other

- Special Education Zones: **Deprived Students Everywhere not just SEZ**
- Gender Equity: **Girls Students Must Be Able to Stay at Home and Study**
 - KG to PG

Online Implications for National Curriculum Framework 2021

- The National Curriculum Framework is aimed at bringing about reforms in the education system and create a Curriculum that is
 - Learner Centric: **Self Paced - Anytime at Any Speed**
 - Has A Flexible Process: **Exam Whenever the Student Wants**
 - Provide Learner Autonomy: **One Room School House Model**
 - Teacher Plays A Role of A Facilitator: **Asynchronous Interaction; Sequential Courses**
 - Supports And Encourages Learning: **Self Defined Major for Each Student**
 - Involves Active Participation Of Learners: **Online Quiz Every 10 Mins**
 - Develops Multidisciplinary Curriculum: **1 Day, 1 Week, 1 Month Courses**
 - Focuses on Education: **Also Peer Learning – Copying Ideas is OK**
 - Brings About Multiple And Divergent Exposure: **The Great Books Course of University of Chicago and Great Books from Wikipedia**
 - Multifarious, Continuous Appraisal In Educational System: **Rishi Valley Model – No Annual Exams – Daily Homework Review and Feedback**

Research on the Future of Education at RGUKT?

- NEP Won't and Can't move Fast Enough
 - Every Recommendation of NEP2020 Must Be Reviewed and Modified In The Context of Empowered Students
- RGUKT Can Validate Concepts for the Future of Education to be Used by NEP in the Future, Such as
 - Self Defined Major for Each Student
 - Create a Plan of Course Work with the Help of a Faculty Advisor
 - That can be modified if the student finds the course boring, too easy or too hard
 - Self Paced - Anytime at Any Speed
 - Demonstrate Mastery of the Subject by Scoring 90% or better
 - Attendance and Fixed Exams may Transition to Anytime Anywhere Personalized Exams
 - Exam Whenever the Student Wants
 - Knowledge Does Not Come in Semester Sized Chunks
 - 1 Day, 1 Week, 1 Month Courses
 - Digitalize All Teacher Education thru National Council of Teacher Education

Future of Education

Remote Learning and Online Learning

Basic Requirements for Online and/or Remote Learning

- Online and/or Remote Learning
 - Requires Access to Computing, Connectivity, Capacity Building and Content
- Computing Device
 - Smartphone, Tablet, or Laptop?
 - Cost Rs10000?
 - Lease option Rs 2000/Year
 - Replace every 4 years? 6 Years? 8+6 Years?
 - 25M to 20M to 15M
 - $20M * 2000 = \text{Rs}4B$ or 400 Crores/year
- Connectivity
 - Fiber to Home and School
 - 5G Wireless option OK temporarily; Too limiting ultimately
 - Unlimited Bandwidth WiFi Free to Student
 - Replace/Use Funds from USO, Universal Service Obligation

Basic Requirements for Online and/or Remote Learning (cont)

- Capacity Building
 - Digital Literacy from Age 3
 - Anytime Anywhere Evaluation
- Teaching the Teachers
 - Online Teach the Teacher Programs
 - YouTube for India
 - Anytime Anywhere Education and Evaluation
- Content
 - National Curriculum Framework
 - Language Problem
 - Bilingual Teachers
 - KG1, KG2, KG3, I, 2 Grade Online Content
 - Digital Literacy
 - Kiddie Coding: Logo (Seymour Papert) and Smalltalk (Alan Kay)
 - Search
 - Voice based

Pros and Cons of Online Learning

- Missing Face-to-Face Contact
- Social Interaction
- Procrastination
- Reduce Dropouts
 - Enable Personalized Coaching
 - Move From Fixed Curriculum to Elective Curriculum
 - Adopt Variable Duration Courses: One Day, One Week and one Month Courses
 - Move to Mastery Outcome model (must get A-grade)
- Permits a KG to PG Online College in Every Village
 - Universal Access to KG thru PG Education in Every Village
 - Every Child has access to a KG to PG school within 2kms
 - One Room School House Model
 - Expand Educational Opportunity to All Villages Using Online Education
 - Quality Teachers Online. Local Teacher's Assistants for Interaction
 - Upgrade Infrastructure: WiFi, Power, Projection LED TV, Chairs, Tables, Toilets

RGUKT As An Online University and a Center of Excellence for Education Technology and Learning Sciences

- Looking to the future, **in a post-COVID world**, the RGUKT model of remote learning with local mentors becomes even more relevant.
- In the future, RGUKT will be able to expand its mission
 - to provide quality education for ALL rural students (not just the top 1%) that currently do not have access to affordable local education.
- RGUKT as an Online University a Center of Excellence for Education Technology and Learning Sciences, can have
 - Affiliated colleges in every village with WiFi and a Tablet for Every Student
 - With a Physical Location and Real Teaching Assistants (selected from the previous local graduates) for Each Class
 - With students having ready access to human guides providing 1-to-1 mentoring and
 - Providing KG to PG Remote Education to All Qualified Students in All Grades
- The same facilities can be used in the evening for employment-oriented remote education for adults.

Proposed IT and Emerging Technologies Research University

- To be Established by the AP Government in Vizag
- to Sustain and Advance the Position of the State
- as the Leading Contributor to the National Talent Pool in IT and
- Cutting-edge Emerging Technologies
- And Supported by The State as an Autonomous Institution
 - not controlled or managed by AP Government.
- It is a Great Idea and Endorse Creating Such An Institution
- State Should Allow It To Achieve Excellence Rather Than Mandate It
 - as a payback for the autonomy, it enjoys

Conclusions

- In the Post-COVID Era, All Recommendations of NEP2020 Must Be Reviewed and Modified to Include Online and Remote Education Strategies
 - Connected Schools and Homes
 - Wifi Desirable. 4G/5G would have bandwidth Limitations
 - Smart Phone/Tablet/Laptop
 - Digital Literacy for All Students and Teachers Starting with Primary Schools
 - Online Curriculum and Content for All Grades from NCERT
- Reinvent RGUKT as an Online University Affiliating KG-to-PG Online Colleges in Every Village
 - Providing Secondary and Post Secondary Education in Each Village thru Remote Learning and Real Teaching Assistants
 - This Would be Complementary to One Year Certificate, Two-Year Diploma, Three-Year BA, and Four-Year BTech