NROER: The Indian OER Initiative

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Abstract

Modern day Information and Communication Technologies hold the promise of equitable access to information and resources. Combined with the concept of the creative commons, the goal of universal access to quality education has entered the realms of a common human's aspiration.

State education systems have striven against systemic, economic, geographic and socio-cultural barriers to ensure convenient access to resources of a comparable quality to all. It is in this context that the National Repository of Open Education Resources (NROER), an initiative of the National Council of Educational Research and Training and the Government of India, should be studied.

Making a significant departure from the conventional definition of OER, this initiative aims to network students, teachers, educators, institutions, governments, curricular and extra-curricular resources, forums, courses, museums, exhibitions, events . . . treating each of these as a resource.

This expanded definition enables the creation of collections of a very heterogenous and diverse nature, simultaneously catering to a wide array of activities ranging from teaching-learning to teacher support, teacher professional development to school planning, system level governance to data representation and data analysis for informed decision making.

The partnership model being adopted creates identities for individuals and institutions, enabling them to showcase their expertise and resources, reaching out to students and teachers. State education systems as partners enable the collation and curation of all digital and digitisable resources, leveraging them to create local and localised collections. This also is an attempt to transform the looming linguistic and socio-cultural differences into celebrations of diversity and catalysts of human resource development.

Began in August 2013, the activity is entering its beta stage shortly and is expected to reach optimum performance over the next three years.

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Introduction

In any large educational system, geographic remoteness coupled with economic backwardness tends to deny children access to resources, which are essential to broaden their outlook and provide them opportunities to realise a learning level commensurate with their talents and efforts.

Experiments have been tried out with different technologies, exploring possibilities they have for enhanced educational access, ranging from classroom devices to broadcast to conferencing. Each of these has helped understand issues at the systemic level, educational delivery and of capacities in the system, which need to be addressed before educational technologies can be meaningfully applied. They have also helped focus attention on what constitutes appropriate technological solutions for different educational problems.

Learning from these and critically applying the insights to exploring modern day Information and Communication Technologies, educationists have come to believe that ICT holds a better promise of equitable access to information and resources. ICT appears to have a combination of features, each better suited to educational delivery than their predecessor technologies – anytime, anywhere access, delivery of multiple media and in multiple languages, capable of reaching out to the physically challenged, two-way synchronous and asynchronous communication and most of all not restricting the users to the role of mere consumers, but enabling them to become producers.

Underscoring the potential of these features of ICT, the National Policy of ICT for School Education (2012) initiated a wide range of initiatives for the school system, including appropriate choices of hardware and software, a comprehensive ICT curriculum for teachers and students, development of digital content repositories, localisation and e-governance.

The National Repository of Open Educational Resources (http://nroer.gov.in), one of the significant mandates emerging out of the Policy came into existence in August 2013. It has begun as a repository of digital media content (audio, video, interactive objects, images and documents) collected into their own libraries. These resources are mapped to key concepts spanning different subjects of the school curriculum. Gradually, the repository intends to cover all grades of school, teacher education, vocational education and adult education. It will also be available in all languages used in the school system in the country, reaching out to all stakeholders.

The NROER platform is undergoing a technological upgrade and its beta version was expected by July 2014.

What is the NROER Platform?

The proposed NROER platform treats every teacher, every

student, every individual and every institution, a node on the network. Similarly, it treats every digital and every digitisable information, be it a media object or even data, a node on the network. This will enable the platform to collect the nodes into collections, which then lend themselves to innumerable activities, interactions and knowledge objects.

This also enables it to make a significant departure from the conventional definitions of OER, treating each of the nodes a resource. This expanded definition enables the creation of collections of a very heterogenous and diverse nature, simultaneously catering to a wide array of activities ranging from teaching-learning to teacher support, to teacher professional development to school planning, to system level governance to data representation and data analysis for informed decision making.

What can Happen on this Network?

Network the school system

The platform enables placing the schools into larger and larger collections, growing from the local to the national. Information generated at each individual school level can be cumulated to facilitate school administration, informing parents and local communities, coopting them in to the system, enable district and state level governance and inform policy planning.

Some immediate examples of data flow and informed decision making can help highlight these possibilities. Longitudinal tracking of children's growth and development, mapping of and identification of talent, say in sports or music, planning of training support to teachers, recognising and catering to infrastructure needs, showcasing and celebrating achievements and raising the bar.

Network teachers

Teachers on the network at an individual level would seek support, critique resources, create and share their resources, and participate in events and activities. Teacher collectives can form self interest groups, academic forums which promote professional activities.

Teacher collectives can curate and showcase resources, offer courses, participate in curriculum development, online seminars and symposia, run their own journals, and, in general, support each other.

Network partners

Any individual or institution can be a partner. Sharing the goals of NROER, the institutions offer their collections of resources, create and manage events, or even offer technological support to the platform. The partnership model being adopted creates identities for individuals and institutions, enabling them to showcase their expertise and resources, while reaching out to students and teachers.

State education systems are also treated as partners. States typically

are a collective of agencies and institutions specialising in curricular resource development, development of student talent in a variety of areas, school administration and management. Together this represents a wide collection of local and localised resources. Translation of resources, digitisation of print resources, collecting and curating resources, and catalysing the participation of artists, educators and thought leaders, offering the school system an opportunity to benefit from their expertise and guidance.

Taking note of the absence of resources in different Indian languages, the shared platform is a way of encouraging the generation of an interest and participation in activities in these languages. This also is an attempt to transform the looming linguistic and socio-cultural differences into celebrations of diversity and catalysts of human resource development.

Create, curate, map and serve curricular and extra-curricular resources

The National Council of Educational Research and Training, New Delhi is mandated with the responsibility of periodically assessing the knowledge base of the education of children, developments in the disciplines, pedagogical understanding, methods and techniques of delivery and assessment of learning. NCERT offers to the nation a curriculum framework guiding the articulation of syllabi

across grades and in the different subjects. Development of teaching learning resources – textbooks, teacher manuals, training, laboratory kits, audio-visual resources, manipulatives and interactive materials and assessment tools – ensues. Institutions in the states – the State Councils of Educational Research and Training, the Boards of Secondary Education, Institutes of Educational Technology, along with the NCERT are involved in the experimentation and development of these resources.

Thus, there exists a very large range of educational resources in print and non-print forms, which can be digitised and made available to the school system. These span all areas of the curriculum and all stages of education. The NROER has set out to collect these publicly available resources.

The NROER presents the curricular mapping, organising the whole into themes, sub-themes and topics. Topics are collections of concepts, people, places, discoveries and inventions, dates and times, measures and measurements. Digital resources are then associated with these topics, providing ready searchable access. Not only does this expand the range of resources available to the teachers, potentially enriching transactions in the classroom, it also involves the teacher in the curation process. Teachers can comment, critique or even reject particular resources. This participatory process is expected to

gradually enhance the specificity and relevance of the resources.

While each of the syllabi, those proposed by NCERT as well as those developed by different states, can simultaneously represent their curricular mapping. At the same time, the platform invites users to propose their own unique mapping. Topics and resource collections so proposed can be based on resources already available on NROER or can be creations contributed to the network. A comprehensive peer review process has been established to critique the proposal and successful proposals are showcased as featured topics. This aims to encouraging diverse use of the resources, innovative applications in the form projects and activities, and showcasing alternate examples of curriculum transaction.

Expand the resources riding on the creative commons possibilities

The NROER in consonance with the directions of the National Policy, has adopted a creative commons licensing. All resources on the NROER shall be available with a cc-by-sa license. This enables the participation of a very large community of users within and outside the formal school system in sharing, remixing and adapting the resources.

One of the immediate benefits of this licensing is in creating an awareness of the legal issues associated with digital content and discouraging piracy. Also, immediately possible is large scale participation in translation

of the resources into different Indian languages, making them accessible to wider audiences.

Celebrate the local and the localised – in every language and for every context

While large-scale adaptations and translations can meet an immediate need for resources in the school system, a better investment would be in developing local resources. The former can serve as a good catalyst of the latter. Constitution of state core teams to spearhead the participation of all has been initiated. Beginning with curricular mapping, progress has been made in translating resources like video documentaries, interactive objects, charts and maps. It is hoped that adequate interest will be generated in making NROER available in every language.

In the larger context of developing capabilities and capacities among teachers and students, localisation carries a far greater significance. The success of NROER is seen in the development of local networks of people and resources even in the remotest corners, their diminishing dependence on the larger world of resources outside seen as a measure of their empowerment- the national rightly being perceived as a collection of a million locals.

Custom collections to meet every need

The NROER platform is capable of supporting a variety of different

applications. The participatory process and the possibility of creating heterogenous collections can support among others the creation and management of books, journals, exhibitions, courses, research, festivals, contests and celebrations. Some of these possibilities have been tried out with encouraging results.

The educational implications of these can be enormous. Teacher education institutions, particularly those that are engaged with only pre-service courses tend to remain outside the mainframe school system. Individuals and institutions outside the system also find it difficult to participate. This is arguably a great loss of human resources. Facilitating their participation in the system can pay rich dividends, not only in the additional energy infused but also in the diverse perspectives that can accrue.

Custom Views of Data to Meet System Needs

One of the important applications of the network of NROER is the possibilities for data as resource. The school system stands to gain enormously from timely availability of relevant data. In the absence of ICT, each data collection exercise remains separated and insights gleaned from its analysis rarely benefits the end user.

With every teacher, every school, every educator and every institution considered a node, NROER perceives a wide variety of data applications.

Suitable data entry apps, data visualisation apps, customised views of data and data mapping (with geo-code, for instance) and cumulation of data at multiple levels (from local to national) are proposed to be developed.

Beginning with the individual student and teacher, who can use it for tracking and monitoring of achievement, inventories and mapping of resources (infrastructure and personnel), it can be used for financial applications, monitoring of scheme implementation, students' and teachers' data (for system level planning), school mapping, among the activities being experimented are geocoding of schools for creation of interactive maps and analysis of board examination results.

Data are also seen as a curricular resource. Availability of large data sets facilitates a variety of activities. Students using these data, their representation and analysis learn to solve problem. Students of teacher education and researchers can use these data to extend the knowledge base and assist in informed decision making. Data available publicly help generate a better understanding of the system and its challenges.

The Roadmap for NROER

The NROER began its journey in August 2013 and is expected to reach optimum performance over the next three years. Three distinct areas of development emerge– mapping the curriculum to include

all areas of interest to students and teachers at all levels; establishing a system of collecting, curating and mapping curricular and extra-curricular resources; and developing the network of teachers, partner-institutions and all individuals desirous of participation.

Mapping the Curriculum

The NCERT curriculum forms the basis for selection of themes, sub-themes, topics and concepts. Currently, the collection spans grades 6–10, covering sciences, social sciences, mathematics and the arts. It will expand to include grades 1–12, covering all subjects of the school curriculum by the end of the year. It will gradually expand to include teacher education, vocational education and adult education sectors.

Curating the Resources – The Metadata, Review and Featuring Process

The responsiveness to search, the relevance of a resource and its availability for repurposing depends on the metadata the resource is associated with. The NROER platform has adapted the metadata standards defined by schema.org and the Learning Resources Metadata Initiative (LRMI).

The challenge of seeking contributions from the public at large is in ensuring the suitability of the resource. A comprehensive peer review

process has been established. Every resource is subjected to a review by three independent reviewers against a published criteria. The process aims to ensure age appropriateness, sensitivity to constitutional and social norms and validity of content.

In the final version of the NROER platform, due to be launched in 2015, every user would be provided a private space to work. This space would contain custom collections of resources, personal creations, work in progress. The user desirous of contributing the resource to the repository declares the resource public (a change of state in the appropriate metadata field), which then notifies the editorial team. This initiates the review process and accepted resources become available on the platform as featured resources. Such contributions can be individual resources or collections.

Bringing the System Together– The Platform, Apps, Users and Partners

The software platform hosting the NROER is based on MetaStudio (http://www.metastudio.org), an initiative of the Gnowledge Labs, Homi Bhabha Centre for Science Education, Mumbai. The beta version of the platform was to be rolled out in July 2014 and further developments will continue over a period of three years. While a core team of programmers help develop the features, the activity leans on the support of different

software professionals who have been contributing ideas. The model encourages a wide participation of people.

Each individual component – be it a video player, or a data form, or a course container or an item bank– is developed as an app, which can be added on by the user. This helps each user to create customised spaces, serving specific applications. Again, the support of a large number of people is being encouraged and facilitated.

Advocating the platform amongst potential users and enrolling them into the activity is being done in two different ways. While every educational system – state governments, boards of school education, teacher colleges, . . . are being requested to enrol teachers under their jurisdiction, many orientation and advocacy programmes are being organised to encourage individuals and institutions to register. As of May 2014, there are about 10,300 registered users. Each state core team will be enrolling all the teachers in the respective states. With the advent of individual user spaces, it is expected that interest will be kindled and participation likely to grow manifold. NROER plans to network all teachers and schools

in three years. Contests, festivals and other events are also being organised to expand participation.

The partnership model of NROER has attracted a number of public institutions. They include institutions with large media collections, educational institutions seeking reach into the school system, and technology partners who have evinced interest in particular applications. All state education systems are being drawn into the partnership and will explore applications in tune with their respective mandates. Individuals with specialised collections have also joined the network. Over the three-year frame, all schools, teacher education and vocational education institutions, and all institutions of the state involved in education would become active participants on the NROER network.

The model hopes to encourage partnerships in a variety of activities, including courses, exhibitions, contests and other events, specialised collections, educational research and teacher support activities. Participation of local groups and institutions will provide more relevant resources at the same time providing enhanced visibility to the institution itself.