School Economics in the National Repository of Open Educational Resources (NROER)

An overview of the developmental process

Aerum Khan*

Abstract

Open Educational Resources (OERs) are increasingly being promoted by enthusiasts in the field of education as a solution to the challenges of access, quality and cost of digital content worldwide. The National Policy on Information and Communication Technology by Ministry of Human Resource Development, Government of India (2012), in its policy goals discusses about creating an environment for collaboration, cooperation, sharing and promoting universal, equitable, open and free access to ICT. The most important aspect of openness is the free availability of resource over the Internet, and recurrence of as few as possible restrictions, in the form of licensing activity, on the use of resource by the users. Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT) and Department of School Education and Literacy, Ministry of Human Resource Development, Government of India has launched National Repository of Open Educational Resources (NROER), which is a digital repository of open educational resources offering resources for all school subjects and grades in multiple languages. The resources are available in the form of concept maps, videos, multimedia, interactive objects, audio clips, talking books, photographs, diagrams and charts, articles, lesson plans and textbook pages. This research paper provides a glimpse to the NROER with special reference to the Economics content of Secondary school level. It is an attempt to provide an overview to the complete methodology of development of Economics content in the form of concepts, concept maps and multiple resources on the NROER.

* *Assistant Professor,* Planning and Research Division, Central Institute of Educational Technology, NCERT, Sri Aurobindo Marg, New Delhi-110 016

Introduction to Open Educational Resources (OERs)

Open Educational Resource (OER) is a new phenomenon which may be seen as a part of a larger trend towards openness in education including more well known and established movements such as Open Source Software (OSS) and Open Access (OA). The most important aspects of openness are the free availability of resource over the Internet, and recurrence of as few restrictions as possible on the use of the resource by users. There should be no technical barriers (undisclosed source code), no price barriers (subscriptions, licensing fees, pay-per-view fees) and as few legal permission barriers as possible (copyright and licensing restrictions) for end-user. The end-user should be able not only to use or read the resource but also to adapt it, build upon it and thereby reuse it, given that the original creator is attributed for her work.

The term Open Educational Resources first came to use in 2002 at a conference hosted by UNESCO. Participants at that forum defined OER as: "The open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes." Open Educational Resources are digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research.

OER is said to include the learning content which have full courses, courseware, content modules, learning objects, collections and journals; tools which are software to support the development, use, reuse and delivery of learning content including searching and organisation of content, content and learning management systems, content development tools, and on-line learning communities; and implementation resources comprising of intellectual property licenses to promote open publishing of materials, design principles of best practice, and localisation of content.

National Repository of Open Educational Resources (NROER)

Keeping in line with the OER movement throughout the world, CIET, NCERT is involved in the development and management of the National Repository of Open Educational Resources (NROER) (Fig. 1). The National Repository is developed in collaboration with the Department of School Education and Literacy, Ministry of Human Resource Development, Govt. of India. Metastudio, the platform hosting the repository is an initiative of Knowledge Labs, Homi Bhabha Centre for Science Education, Mumbai. NROER was launched by the then Honorable Union Human Resource Development (HRD) Minister, Govt. of India Dr. MM Pallam Raju in presence of the then Honourable Minister of State for

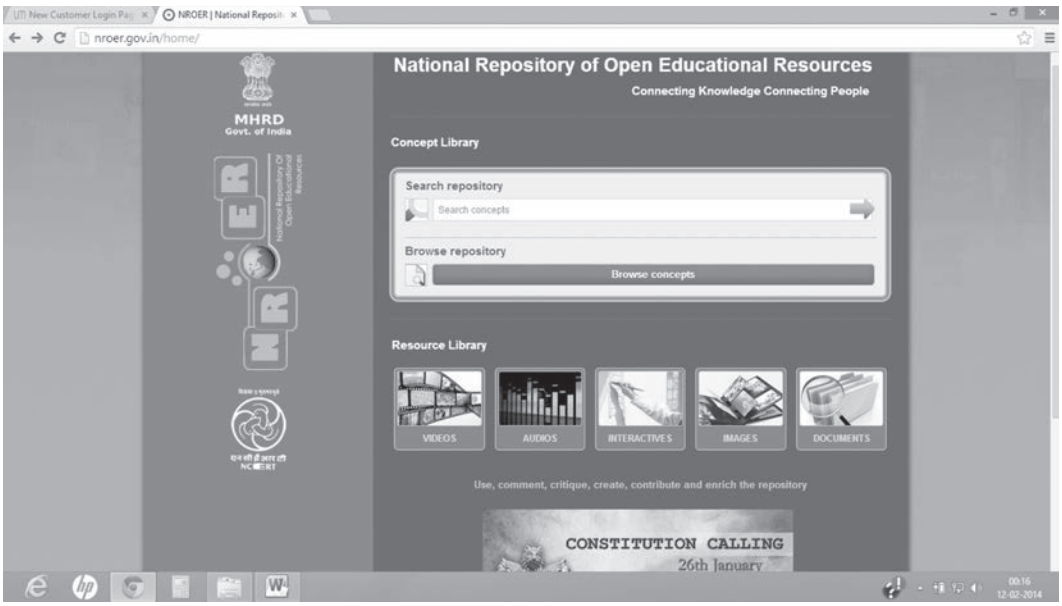

Fig. 1: The interface of National Repository of Open Educational Resources (NROER)

HRD Dr. Shashi Tharoor, the then Secretary, Higher Education Shri Ashok Thakur, the then Secretary, School Education and Literacy Shri Rajarshi Bhattacharya, the then Director, NCERT Professor Parvin Sinclair and other distinguished guests during the National Conference on ICT (Information and Communication Technology) for School Education on 13th August 2013 in New Delhi.

NROER is a solution developed to address the challenges faced by the education sector of our country. It intends to reach the unreached, include the excluded and extend education to all. It is a collaborative platform involving everyone who is interested in education. It offers resources for all school subjects and grades in multiple languages. It brings together all the digital resources for a school system such as educational videos, concept maps, audio clips, interactive objects, photographs, diagrams, charts, images, articles, learning objects, talking books, textbook pages and documents, any resource that can be served digitally. The major objectives for developing the national repository are:

- to make digital electronic content available for teachers and students.
- to enable the participation of the institutions/ organisations, community in development and sharing of digital resources.
- to create mechanism to evaluate digital content.
- to provide platform for teachers and students to participate in online courses.

Licensing Process on NROER

Open Educational Resources provide teaching learning fraternity with the quality study materials to facilitate the expansion of learning worldwide. By the use of open licensing the teachers and learners can be liberated from the concerns of the permissions and other conditions attached with the use of content or software. NROER uses Creative Commons license for promoting quality education. Creative Commons has six types of licences. NCERT has taken the initiative of declaring that NROER carry the CC-BY-SA (Creative Commons Attribution — Share Alike) license instead of CC-BY-SA-NC (Creative Commons Attribution Non Commercial Share Alike) which contains a more restrictive clause and was advocated by Wikimedia and other advocates of open educational resources (Fig. 2). This decision by NCERT is in tune with UNESCO's Paris Declaration on Open Education Resources and will ensure that all the resources are freely accessible to all. To put it in the language of the Creative Commons—to reuse, revise, remix and redistribute.

Development of Economics Content on NROER

NROER is based on concepts; the complete structure of it is knitted around the concepts which are extracted from the textbooks of NCERT. The Repository is offering the content for all the levels of school education, starting from Elementary level and proceeding to Secondary

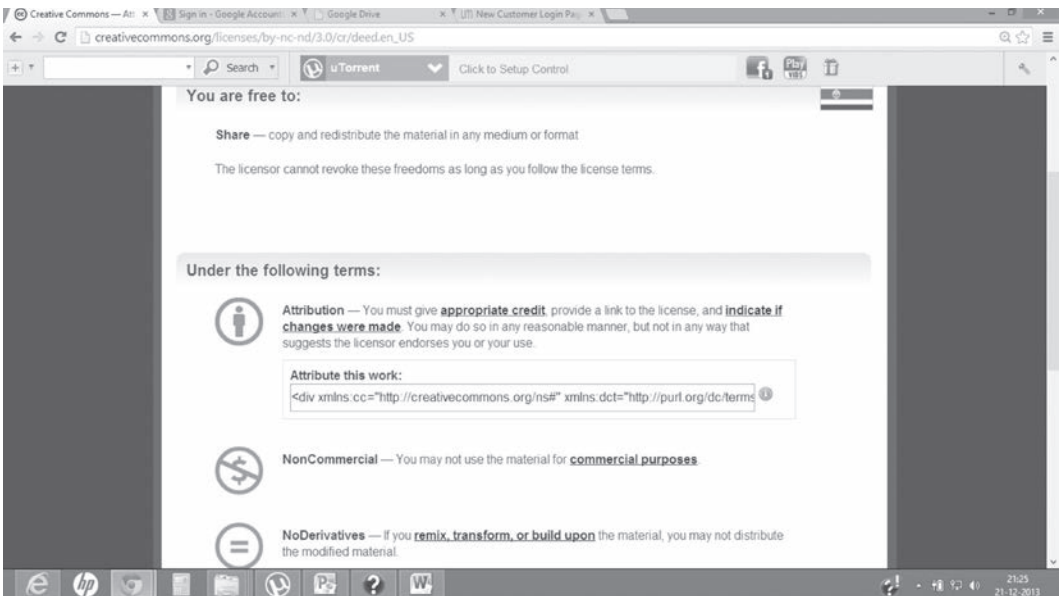

Fig. 2: Details of licensing process provided by Creative Commons

and Senior Secondary Levels. In the subject of Economics the NROER is starting with Secondary level, there are more than 45 concepts listed in the subject. All these concepts are linked with each other to constitute a concept map. The whole process of development of Economics content on the NROER is discussed as under:

(1) Identification of the Concepts of Economics

The process of concept identification in Economics started by the thorough study of the textbooks of 9th and 10th along with the syllabus document of NCF 2005 by faculty members and through workshop mode, the concepts were listed out and debated upon among the group of teachers of various Government and Private schools while the workshops and after that the final list of concepts to be shown to public after uploading on NROER was finalised (Fig. 3). In the meantime the concepts identified by the internal faculty was also standardised through the workshops by the group of teachers.

(2) Concept mapping of identified concepts providing them relations and reverse relations

As the NROER is based on concepts, it organises its collections into an ever growing semantic map of concepts. Concept mapping is the essential part of process of development of the repository; therefore the institute is working towards this direction. The concept map itself is a learning resource for teachers, providing an opportunity for critically assessing the curriculum and aiding the construction of their own unique

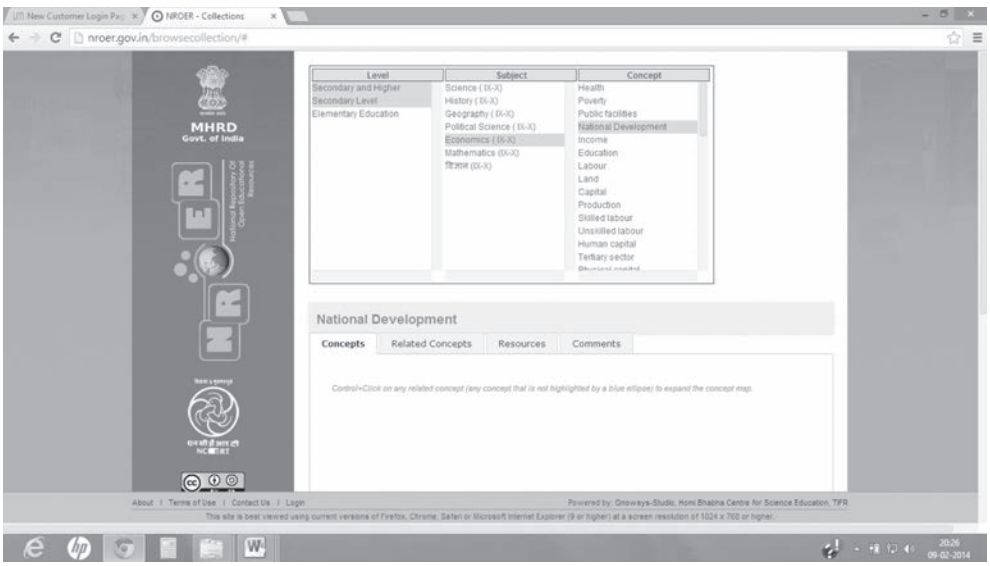

Fig. 3: Concept list of Economics for Secondary level displayed on NROER

learning themes for their classrooms. The digital resources are mapped to concepts. This enables access to a library from which teachers can choose appropriate resources. Each resource is tagged to related concepts making it accessible for use. The resources can be downloaded and commented upon and are released for free use.

The concept maps on NROER are prepared by groups of teachers along with CIET faculty members in workshop mode. The concept maps primarily were sketched on charts or sheets of paper by the group of teachers by making discussions on the different aspects on which the relationships between the concepts constitute in order to produce a complete semantic map. The speciality of concept maps on NROER is that there is a reverse relationship also with every relationship among the concepts. After the preparation of concept maps they were presented in front of the forum of teachers and subject experts for verification, after verification the uploading of concept maps was executed on NROER web site.

If a ctrl + click is executed with any concept of the concept map the concept map expands, and on clicking to any concept of the concept map the designated page for the concept opens, which comprises the Concept Name with its definition(s), and other details like related concepts, resources and a comment box, this resultant feature of getting the page for a particular concept is same when we search or browse any concept on the NROER (Fig. 4 and 5).

(3) Adding up of multiple resources with every concept

On the NROER, after linking the concepts with each other in the concept maps the concepts were

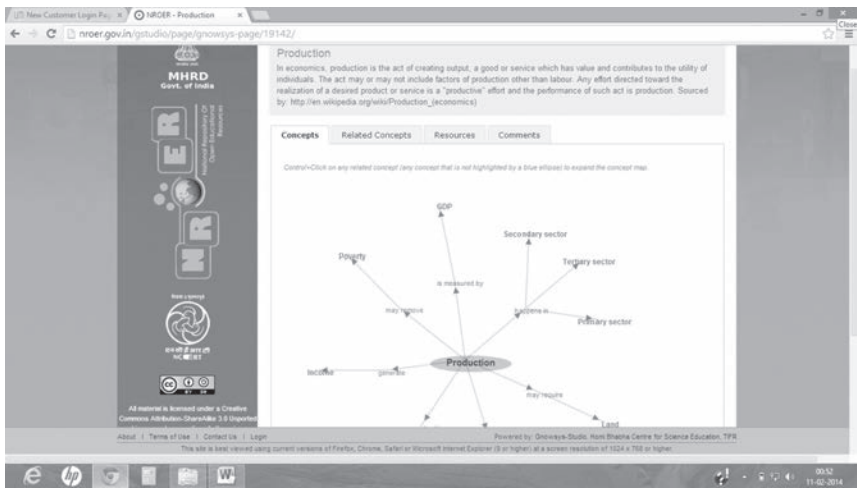

Fig. 4: A concept page from the Economics concept list on NROER, showing definition of the concept, buttons for related concepts, resources, comments and concept map as a default feature.

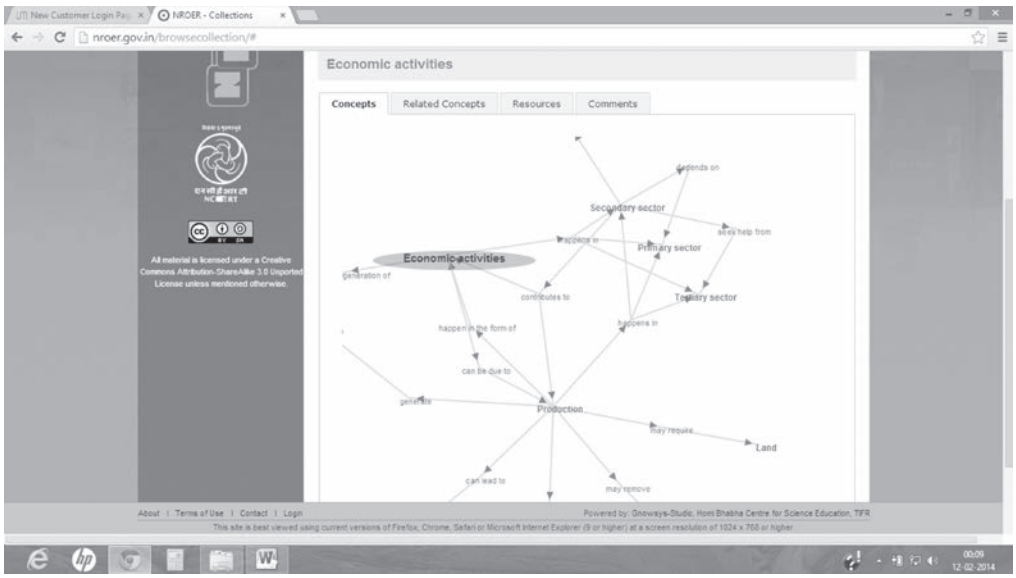

Fig. 5: A ctrl + click expands the concept map to its extension limits

mapped with different available related resources like videos, audio clips, images, documents, etc. (Fig. 6). These resources can be accessed by the people in various ways, they can view download, use, reuse, revise, remix and redistribute these resources, in this process they have to take care of releasing the revised resource again on NROER under CC BY-SA license.

(4) Tagging of concepts to allow multiple access with other related concepts and resources

On the NROER every concept is provided with certain tags, these tags are the nearest neighbourhood terms or most appropriate related key term with the concept. By assigning tags the application of search option is enhanced as these key terms help in navigating through the related resources for the concept because every related resource for the concept is also tagged with the same tags/key words (Fig. 7).

Advantage of Concept Mapping as a Tool for Learning

NROER is completely based on concept mapping and online accessibility of resource in such a form which bridges the gap between cognitive learning and application based learning. Concept maps are based primarily on the learning theories of cognitive psychologists, specifically Ausubel's Assimilation theory. A concept map helps represent ideas in a way that models an individual's cognitive structure.

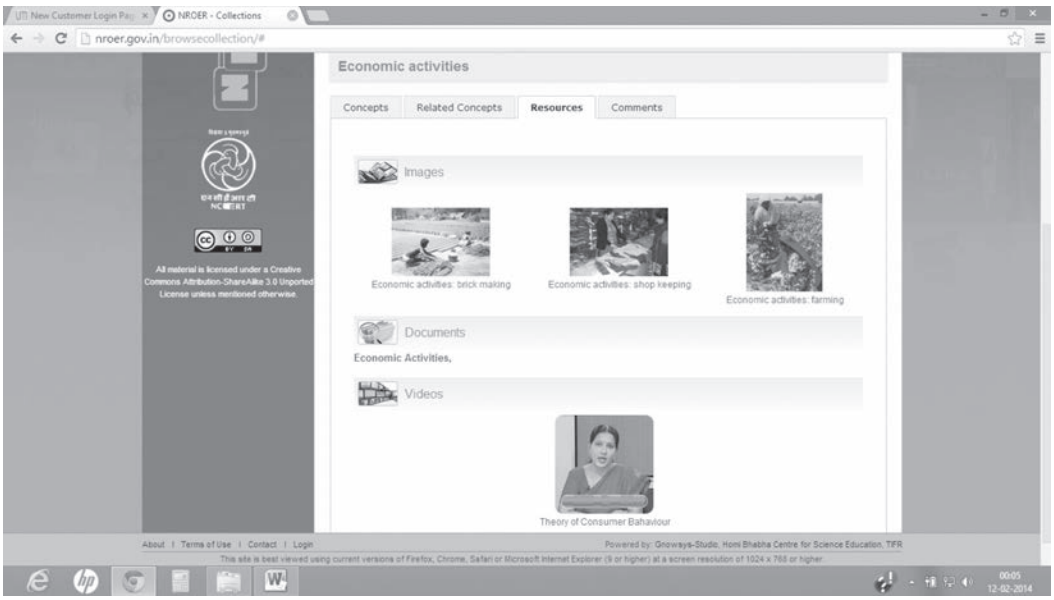

Fig. 6: The resource page on NROER showing multiple resources for the concept of 'Economic activities'

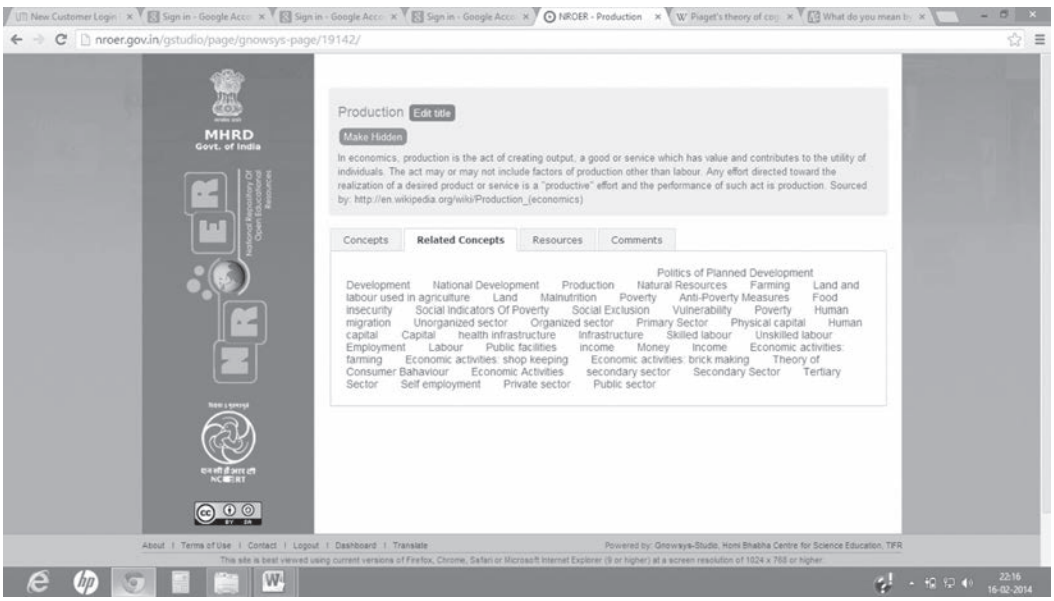

Fig. 7: The window on NROER showing related concepts/tags with the concept 'production'

According to David Ausubel, "the most important single factor influencing learning is what the learner already knows" (Novak, 1998). Relationships between concepts are formed when two concepts overlap on some level. As learning progresses, this network of concepts and relationships becomes increasingly complex. Ausubel compares meaningful learning to rote learning, which refers to when a student simply memorises information without relating that information to previously learned knowledge. As a result, new information is easily forgotten and not readily applied to problem-solving situations because it was not connected with concepts already learned.

However, meaningful learning requires more effort, as the learner must choose to relate new information to relevant knowledge that already exists in the learner's cognitive structure. This requires more effort initially, however after knowledge frameworks are developed, definitions and the meanings for concepts become easier to acquire. Further, concepts learned meaningfully are retained much longer, sometimes for a lifetime. Teachers can encourage creative thinking by using tools such as concept maps.

Educational Implications of NROER: What People (Teachers, Students, etc.) Can Do on the Repository?

The NROER provides multiple resources for every concept in order to make the teaching-learning process of the same more effective. These resources are present in the form of videos, audio clips, interactive objects, images and documents. Anyone who accesses the repository can view, download, use, remix, revise, reuse and redistribute the selected resource, but the revised resource should be shared again on the repository for further dissemination of the same, as all the resources are released under CC BY-SA licence on the NROER. This process has a wide scope of frequent use of digitised content by the society, fulfilling the most important objective of NROER. In addition there are some more educational implications, listed as under:

(1) Contribution of digitised resources by teaching-learning community on the NROER

The collaborative creation of e-content is among the aims of NROER, to fulfil this aim NROER invites contribution of resources from the teaching-learning community or anybody who has created or retrieved any open educational resource and want to release the same under CC BY-SA license (Fig. 8). For making a contribution one has to register on the Repository after that a small form with fields for licensing attribution and details of the contributed resource is to be filled, this is followed by attaching the resource to be contributed, and submitting on the NROER. The contributed resource will be uploaded on the Repository after

Fig. 8: Window for contribution of resources on the NROER

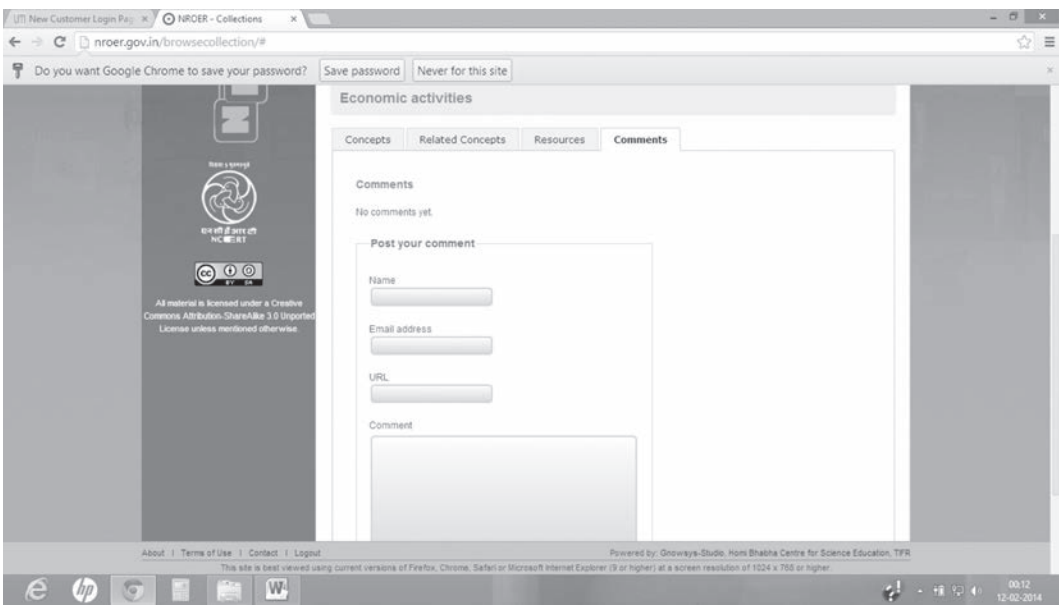

Fig. 9: Window showing comment/critique option on the NROER

evaluation of the same, evaluation is done by a structured mechanism on NROER.

(2) Commenting, critique on the concepts or related resources

NROER follows a democratic mode of action which includes active involvement of users and contributors by the means of commenting or critique on any aspect of the Repository, be it resources, descriptions, concept maps, definitions or others (Fig. 9). The users can also rate a resource by assigning stars to it. This process allows the management team to continuously receiving feedbacks and acting accordingly. This process also allows a user to share the ownership of a resource as everything is released under Open Access Scenario on NROER.

Conclusion

The open educational scenario worldwide and especially in India is gaining popularity with every passing day. National Repository of Open Educational Resources (NROER) is an enthusiastic project in this row. Resources housed on NROER are free to access, reuse, remix and redistribute by anybody, as they are released under the CC BY-SA licence. With NROER the NCERT is willing to cross the boundaries of the textbook. The Economics content is one of the examples in this line. The dream of NROER will be realised when it becomes useful for each and every teacher, each and every child, across geographies, bridging the digital divide. This dream requires the contribution and critical participation of each one of us. Be a part of the movement.

Web Resources

- *http://nroer.gov.in*
- *http://www.oecd.org*
- *http://www.openaccessweek.org/*

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