Field Testing Experiences of OER4s Project

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Abstract: The concept of an Open Educational Resource (OER) was started by an Open Software movement. OER is the simple and powerful idea that the world's knowledge is a public good and that technology in general. The World Wide Web in particular provides an extraordinary opportunity for everyone to share debate and discuss, use, and reuse knowledge. Quality OERs play a vital role in quality assurance in liberal as well as vocational education. The notion of an OER is now well adapted, accepted and appreciated all over the world. The developing countries are facing the challenges of creating appropriate content, affordability of infrastructure, and availability of connectivity.

For the last five years Homi Bhabha Centre for Science Education (HBCSE), Maharashtra Knowledge Corporation Limited (MKCL) and the Indian Consortium for Educational Transformation (I-CONSENT) was engaged in developing Open Educational Resources for Schools (OER4S) aiming at offering Quality School Education for All, and for sustainable development of local situations – classrooms, schools and local community - by linking them to global scenario. The mentioned project is being funded by the Rajiv Gandhi Science and Technology Commission of the Government of Maharashtra, India. The content in regional language was developed through a series of workshops organized involving practicing teachers, teacher educators, enthusiastic parents and subject experts, so far more than 3000 modules in school science and mathematics were developed. These modules were made available to the stakeholders (teachers, parents and students) through a website (www.mkcl.org/mahadnyan) specially developed for the project by the Maharashtra Knowledge Corporation Limited (MKCL).

This paper shares the field testing experiences of 410 (200 science & 210 mathematics) teachers about OER4s Project. For all these teachers the 12,000 pages school science and mathematics material is useful and supporting their classroom teaching. There is scarcity of resources in regional language compared to English at school level. The real challenge we faced was creating/developing quality resources in regional language but during the field testing the issues of an insufficient human interaction between teachers and students, the technological issue such as connected with slow or erratic Internet connection and technical support were immerged. The work referred here provides both opportunities and challenges. This paper attempts to highlight some of them which are very relevant for developing countries OER movement/mission.

Key words: OER, Field testing, School education, Stakeholders material

Introduction: During last three decades of nineteenth century our lives are influenced greatly by Information and Communication Technology (ICT). The developments in ICT have enabled us to communicate with each other quite fast. It has, thus, given rise to a connected society. We can now get many things done like transfer of money, booking an air journey and reserving a room in the hotel by sitting at home. More importantly, ICT developments have led to the availability of information for Anyone, Anytime and Anywhere (A3). Present society is, therefore, called as Knowledge Society. This phenomenon of free flow of information has, thus, become the fact of life for the first time in the history of mankind (Smith & Casserly, 2006).

Indian education system is full of diversities. We have schools run by local self governments, central government bodies and private organizations. The curriculum followed and the facilities provided in these systems are widely different. In spite of these differences one thing is common in all these systems and that is the need for out of school support. A variety of voluntary organizations are trying to fulfill this requirement (Sharma, 2005). But they are small in number and are clustered in certain parts of the country. There is therefore a need for a support system that will be available anywhere and anytime. With this view in mind the Homi Bhabha Centre for Science Education (HBCSE), a constituent unit of the Tata Institute of Fundamental Research (TIFR) has launched a project on Open Educational Resources for Schools (OER4S).

The Project: The project aimed at designing appropriate educational resources that can be used by school students, their teachers and parents. This paper gives a comprehensive account of the project implemented in the state of Maharashtra for six academic years from 2007 to 2013 with the generous financial support from the Rajiv Gandhi Science and Technology Commission, Government of Maharashtra. The approach taken was to design appropriate written material and make them available free of cost to all the stakeholders of school education namely, students, teachers and parents. Such resources are popularly known as Open Educational Resources (OER). Hence the project was has been named as Open Educational Resources for Schools (OER4S).

Development and deployment of OER: Development and deployment of OER included following steps sequentially.

1. Determining the nature of digital resources through meetings of experts and seminars for teachers.

2. Creation of resources suitable for standards 1 to 10 in science and mathematics through resource generation workshops.

3. Processing of the handwritten units to convert them into digital forms.

4. Quality assurance of the units for its correctness and method of presentations.

5. Tagging of the unit and compiling them using Content Development and Integration Tool (CDIT) designed by the Maharashtra Knowledge Corporation Limited.

6. Publishing of the final website (www.mkcl.org/mahadnyan) by MKCL.

7. Information dissemination of the website among end users.

Field Testing: Field testing of the OER designed was undertaken to check the suitability and relevance of the resources. The main purpose of the field testing was to get feedback from the end users and to modify them based on the feedback. The steps involved in the field testing can be mentioned as follows.

1. Identification of educational institutions for extensive field testing of the resources generated.

2. Training a group of science and mathematics teachers to use the resources and to encourage other stakeholders like students and teachers to use them.

3. Getting feedback from all the stakeholders regarding the relevance and utility of the resources.

4. Incorporating suggestions received and modifying the units to make them more effective and useful.

The resources were prepared based on the experiences gained in the field projects undertaken by HBCSE and the inputs received from the experts, teachers and field workers. Nevertheless, it was felt necessary to field test the resources for its relevance and utility. Once the website was launched we have embarked on field testing. The main purpose of field work was to get feedback from all the stakeholders on OERs uploaded on the website. Based on the feedback received appropriate midcourse corrections were made in the resources. The modified resources were put once again on CDIT and then published by MKCL at an appropriate time.

Identification of educational institutions: With a view to field test Open Educational Resources developed through the project two educational systems in the state of Maharashtra were identified in consultation with the officials of the I-CONSENT and MKCL. One of them is popularly known as the Rayat Shikshan Sanstha with headquarters at Satara in western Maharashtra. Established by a well known social worker Shri Karmaveer Bhaurao Patil, the system has more than 100 schools spread over 11 revenue districts of the state. The system attempts to fulfill the needs of students in Western and northern Maharashtra. These schools cater mainly to rural students population as well as students coming from unprivileged communities.

Another system that was identified for the field testing is known as the Shivaji Shikshan Sanstha with its headquarters at Amravati. Established by another well known educationists Shri Panajabrao Deshmukh. These schools cater to the needs of students in Vidarbha region of the state of Maharashtra. This system is also quite large with more than 100 schools spread in about 8 revenue districts of the state.

Negotiations were made with the office bearers of both these educational systems. Explaining the concept of Open Educational Resources for Schools (OER4S) in regional languages the point was brought home how useful they can be to bring qualitative change in school education. Cooperation was sought from the management to send a group of science and mathematics teachers for training to HBCSE. Moreover, decision makers were convinced to make available the computers with internet connections to science and mathematics teachers. Since the resources cater to students as well as parents the appeal was made to make available this facility for both these stakeholders.

Workshops for Science and Mathematics Teachers: Hundred science teachers and hundred mathematics teachers working with Rayat Shikshan Sanstha were identified and invited to HBCSE for a three day training each. Similarly, hundred science and hundred mathematics teachers from Shivaji Shikshan Sanstha were identified and invited to HBCSE for three day training. During this training the teachers were familiarized with the website containing the open educational resources. After giving them the instructions on how to access the OER they were given an opportunity to actually see and download them. Apart from resources made for science and mathematics teachers they were acquainted with the resources for students and parents and also with common resources designed for all the stakeholders. Within a span of three days they could acquire adequate ITC skills to locate about download the resource they wanted.

With a view to reach more number of practicing teachers we have decided to conduct training courses in schools. Since the education systems identified for field testing are very big and are spread over many districts these workshops had to be arranged in different regions. Suitable places with computing facilities were identified for conducting these workshops. Teachers who came were acquainted with the website and given inputs on how to access the resource of their choice. Adequate practice sessions were arranged so that the teachers have enough confidence to locate and use OERs in the classroom.

Difficulties in field work: Through the workshops conducted at HBCSE at different places in the state we have tried to familiarize the teachers with the website. It was hoped that they would log-in in large numbers and start using the resources. This expectation did not get fulfilled. Enquiry into why

this is not happening revealed that many teachers do not have access to website. Although the internet facility is expanding in the country some of the schools do not have dedicated internet connection. Two solutions were suggested in this case. Firstly, schools were requested to acquire dongle that can provide access to World Wide Web. Secondly, teachers from such schools were requested to get the relevant material downloaded either from the Cyber cafés or from one of the centers of Distributed Classrooms set up by MKCL. If required we have shown willingness to provide resources on a Compact Disk (CD) for use.

Some schools have recently acquired computers and have started teaching how to use them. For this a dedicated computer teacher is appointed in most of the schools. Science and mathematics teachers have to look for a time slot that is free before entering into computer room. This restriction, as per the opinion of some of the teachers, is causing difficulties in the use of OER. In this context we have tried to talk to the school management and school headmasters to make available time for the use of computers by science and mathematics teachers.

Apart from school teachers we have prepared resources for students and parents. Our contact point is teacher and we wish to approach other stakeholders namely students and parents through them. This idea does not seem to work. Teachers are happy in limiting themselves to prescribed text books, passing on information and providing assignments from the text book. For a majority of teachers success in the school examination is the most important outcome of school education. They do not feel the need to expose the students to other sources of learning. As a result, not many students have registered on the website even though their number is so big in both the school systems. Efforts will have to be made to sensitize the school students in the use of OER from the website.

There is a report based on limited interaction between teachers and parents. Parents come to school when their wards have some problems or when there is a meeting of teacher parent association. These interactions are inadequate to pass on the message of OER for parents and to create confidence among them to access them. It seems extra efforts will have to be made to reach to the parents, convince them to use OERs and get feedback from them.

Feedback received: As mentioned above efforts are being made to get feedback from students, teachers and parents about the utility and relevance of the OERs prepared for them. There are various ways they can send us their feedback. A computer savvy person can send us feedback through email. Others can send the feedback through written mode by snail mail. For those who are not inclined to write the option of making a telephone call is available. In spite of all these options the feedback received is measure. What we have is the feedback collected during the workshops held at HBCSE to acquaint the teachers with the OER website.

During the workshops held at HBCSE an attempt was made to get the opinions of teachers about the resources. They were appealed to come forward and express their opinions. Some teachers resorted to this mode of giving feedback. In addition, feedback was received through a specific Performa prepared for that purpose. A questionnaire was designed to seek relevant information from them. It had two parts: the first part sought personal information about a teacher along with his/her knowledge of computer and use of internet while the second part sought for their opinions about OERs. The questions raised in the first part are listed below:

1. Have you ever used the computer individually?

2. Have you attended any course to learn the use of computer?

3. If you have used the computer, for what purpose have used it?

4. What language can you type on the keyboard attached to the computer?

5. Which software do you use while working on the computer?

6. Are you aware of the term pdf file?

7. Have you ever used computer in teaching? If yes for what purpose?

8. Do you use internet facility?

9. If yes, how frequently?

10. If you have not used internet what are the reasons behind it?

11. Have you ever used internet in teaching?

12. Have you ever visited an educationally useful website?

13. Do you have your e-mail address? If yes mention it.

The data collected through these forms are being analyzed. However, general impressions gained while looking at the data can be given here.

1. Computers are making their headway in schools. Nonetheless, exposure to the use of computers is very limited. A majority of teachers are still unfamiliar with terms like PowerPoint, pdf file, Page maker, Photo Shop, Coral Draw, etc.

2. A large number of teachers have registered for a course called MS-CIT (Maharashtra State Course in Information Technology) implemented by MKCL all over the state of Maharashtra. Many of them have completed the course in due course of time. However, only a few teachers have the confidence to use the computers.

3. The word Internet is familiar to almost all the teachers as it is used in railway reservations and other activities. However, teachers hardly have a mastery in locating a particular website for their use. Only about 10 percent of the teachers had their own email addresses.

4. For a majority of teachers prescribed subject text books are sufficient to teach school science and mathematics. They do not see the need to look for any additional material or different mode of interactions in classroom proceedings.

5. Teachers are skeptical how the use of computer and internet will improve the scholastic performance of the students. For a majority of teachers scores in the examinations are of utmost importance. In their opinions the computers should be used to enhance the scores and not to enhance understanding.

As stated above the second part of the questionnaire focused on getting their opinions about mahadnyan website. There were 14 questions in this section. They are listed below.

1. Have you seen the resources on the mahadnyan website?

2. Do you think this website will be of use in improving teaching learning process in schools?

3. How will you use the resources on the website for your day to day teaching?

4. Can this website be used for self learning?

5. Have you found resources that are required for classroom interaction on this website?

6. What type of material should be included on this website to make it effective and relevant?

7. What is your opinion about the utility of the mahadnyan website?

8. How can students use the website?

9. How can parents use this website?

10. What type of resources would you suggest that would prove useful for students?

11. What type of resources would you suggest that would be useful for parents?

12. Have you written any unit for the mahadnyan website? If not are you willing to contribute?

13. In what way you can support OER activity?

14. What difficulties do you envisage in using the website?

The data thus collected is being analyzed quantitatively. The present section, however, presents a qualitative analysis of the data.

1. In general all the participants appreciated the task of designing OER in regional language, Marathi as no such material is available. Most of the resources that are made available on the website are in English. A few website have begun translating them into regional languages. However, they are of general nature. Resources specifically addressed to school education are hardly available in regional languages.

2. Both science and mathematics teachers liked the idea of designing resources not only for school students and teachers but also for parents. Parents, in their opinion play a crucial role in shaping the behavior of children. They felt that the attitude and motivation of students towards school education are largely influenced by the parents.

3. Teachers liked all the common resources designed for the use by all the three stakeholders. The stories about scientists and mathematicians, they felt, would go a long way in motivating students to opt for careers related to science or mathematics. Similarly, the answers to a large number of questions given on the website, teachers opined, would help satisfy students' curiosity to a great extent. The section that appealed most was the section on Open Forum. Since this forum enables the teachers to share their experiences and opinions, they thought the website has provided a space for their own voice.

4. The website, many of the teachers opined, fulfils the felt needs of students, teachers and parents. Hence, would prove useful for all the stakeholders. However, the culture of using resources outside the prescribed textbook for school related tasks has not yet spread in our country. It would take time for this culture to take roots. Only then the material made available on the website would be used profusely by all the stakeholders.

5. While appreciating the efforts made by HBCSE, MKCL and I-CONSENT teachers went further to suggest the nature of resources that would prove more useful. Firstly, they have suggested that the resources should be illustrated using good pictures ad cartoons. While giving a positive opinion about OER development they also suggested that the resources should be such that they can be used directly by the teacher in the classroom or outside the classroom.

6. While applauding the efforts to design the website the teacher shared their concern about its use in rural areas. As the situation stands the facility of internet is not available in many schools. Moreover, the teachers are not computer savvy to access the resources. Efforts will have to be made to enhance internet facility in schools as well as computer literacy among the teachers, students and parents. For this they have suggested that special training courses be conducted to achieve these objectives.

Outcomes and Implications: Over a span of six years the project resulted into Open Educational Resources worth 12,000 pages. These resources have been prepared taking into account the needs and requirements of school students, their teachers and parents. More importantly, these resources are made available in regional language (Marathi), which is the medium of instructions for majority of schools in the state of Maharashtra. This project has thus fulfilled the long felt need of supporting material in regional language. A selected group of teachers from all over the state were invited to

participate in the resource generation workshops. Moreover, interaction was arranged with a big batch of teachers from two different education systems with a view to field test the resources. The project has thus created a network of about 1500 teachers. Some of them have a good flair of writing. They can be encouraged to continue preparing OER in the future. By continuing these efforts it is possible to realize the dream put forth by National Knowledge Commission (Takwale, 2009). Four different organizations came together to undertake the task of designing OER for schools. Thus, the collaborative mode of working for the common cause of improving quality of school education in science and mathematics proved successful.

National Knowledge Commission (2007) set up by the Government of India clearly brings out the importance of open access to information and Global Open educational Resources. The work reported in this paper is in tune with the recommendations of the commission, especially open access nature. It must however be noted that the work envisaged in this project is of gigantic nature. It needs the cooperation of people in developing content, pedagogy, technology as well as in assessment strategies (Daniel & Kanwar, 2006). From the field testing workshops it is very clear that teaching community has welcomed the idea of OER material. At the same time there are encouraging responses from students and parents also. India shares common educational problems with many developing countries. It is, therefore, hoped that the open educational resources developed and strategies and systems generated in this project will have a global relevance to bring about qualitative improvement in teaching and learning of science and mathematics all over.

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