

Virtual Open Schooling in India

Feasibility Report



Commonwealth Educational Media Centre for Asia
New Delhi



National Institute of Open Schooling
NOIDA, Uttar Pradesh



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By

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Prepared on behalf of

Commonwealth Educational Media Centre for Asia
New Delhi

17 January 2013

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Acknowledgements

Several people have provided inputs towards preparation of this Feasibility Report and I am grateful to all of them. They have been very forthcoming, motivating, and encouraging, while offering their expertise and time. I would like to thank Dr Sanjaya Mishra, Director, CEMCA for his thoughtful comments and creative suggestions that have added value to the report. I am also thankful to Mr. R. Thyagarajan, Head, Administration and Finance, CEMCA for his unstinted support towards completion of the report.

I further acknowledge with gratitude the help extended by Dr. S.S. Jena, Chairman, National Institute of Open Schooling (NIOS), Noida for his vision and motivation. My thanks are also due to Dr. Sanyam Bhardwaj, Director, Student Support, NIOS; Sh. U.N. Khaware, Secretary, NIOS, Dr. S.K. Prasad, Systems Analyst and Programmer, NIOS; Sh. C. Dharuman, Director (Evaluation), NIOS; Dr. K. P. Wasnik, Director (Vocational), NIOS; and Dr. Kuldeep Agarwal, Director (Academic), NIOS for providing continuous support.

I thank Prof. Rajaram S. Sharma, Joint Director, CIET, NCERT, New Delhi; Dr M U Paily, Associate Professor, Regional Institute of Education, (NCERT), Mysore; Prof.(Dr.)S.K. Singh, Vice Chancellor, Madhya Pradesh Bhoj (Open) University, Bhopal; Dr. Vinay Kumar Pathak, Vice Chancellor, Uttarakhand Open University, Uttarakhand; Prof. (Dr.) Rajendra Vinayak Vadnere, Director, School of Continuous Education, Yashwantrao Chavan Maharashtra Open University, Nashik; Dr. P. Prakash, Vice-Chancellor, Dr. B.R. Ambedkar Open University, Hyderabad; Mr. T. C. S. Naidu, Joint Commissioner, Navodaya Vidyalaya Samiti, NOIDA for providing relevant inputs, suggestions, and feedback during the Consultative Workshop held in October 2012.

Contributions from Chhattisgarh State Open School, Kerala State Open School and Rajasthan State Open School are also gratefully acknowledged, they provided necessary data used in this report.

(R. C. Sharma)

Terms of Reference (TOR)

CEMCA requested the preparation of a feasibility report on “Virtual Open Schooling in India” with the following TOR. The feasibility report shall:

- be based on stock-taking of the use of Information and Communication Technologies (ICTs) in Open Schools, their existing capacities to use online technologies, courses and programmes already on offer online, etc. through interaction with staff and students, using surveys and review of existing literature and documents,
- recommend a model for offering online programmes of Open Schools in India from admission to certification,
- suggest possible technological solutions, including use of existing platforms/technologies, if any, to offer virtual open schooling,
- critically analyse the possibility of launching consortia-based online platform for all Open Schools in India to offer courses online leading to certification
- list and suggest the administrative as well as pedagogical approaches, including integration of synchronous and asynchronous technologies, payment gateways, open badges for assessment, student data management, etc.
- include a plan of action, timeline and budget for implementation and suggest pathways for developing sustainable Virtual Open Schooling.

Virtual Open Schooling in India

Executive Summary

1. Introduction

Indian education system is facing challenges of increasing access to masses while maintaining standards. Introduction of National Vocational Educational Qualifications Framework (NVEQF) speaks of the commitment of the Government towards promoting vocational based courses for creating a workforce who shall be job creators instead of job seekers. The success of Sarva Shiksha Abhiyan (Universalisation of Primary Education) has escalated the demand for education at secondary level. Under the Rashtriya Madhyamik Shiksha Abhiyan (RMSA) (for Universalisation of Secondary Education) "The vision for secondary education is to make good quality education available, accessible and affordable to all young persons in the age group of 14-18 years" (RMSA Framework, MHRD, 2009). The vision statement under RMSA lays greater stress on three A's which are Availability, Accessibility and Affordability of secondary education to the target group.

2. Expansion issues

The Working Group on Secondary and Vocational Education for the 11th Five Year Plan (2007-2012) pointed out certain challenges of secondary education like lack of access, low participation, equity and quality issues. It further reported that on an All India average there are only 4 secondary and higher secondary schools per 100 sq.KM area, which becomes worse in case of large States like Bihar, Uttar Pradesh, Rajasthan, Madhya Pradesh, Chhattisgarh and Jharkhand where the numbers are less than national average. The Mid Term Appraisal of the 11th Five Year Plan (2007-2012), has indicated for an urgent need of:

- Strengthening 44,000 existing secondary schools
- Opening 11,188 additional secondary schools (through up-gradation of upper primary schools)
- Appointing 1.79 lakh additional teachers and
- Constructing 80,500 additional classrooms.

In addition, the Right of Children to Free and Compulsory Education (RTE) Act, 2009, as put into force as legislation under Article 21-A, grants all children a right to full time elementary education of equitable quality, norms and standards. RTE provides specific provisions for disadvantaged groups, for example, children from SC/ST, and other socially and educationally backward categories based on cultural, economic, social, geographical, linguistic, gender or other categories that the appropriate governments can separately notify (MHRD, 2012).

3. Potential of ICTs

Thus it is very evident that for India to meet the demand for effective learning for all suitable measure need to be taken. ICT is one such tool which can help realising this goal by reaching to large audiences. Methodologies of open and distance education have been time tested in India and we have exemplary institutions like National Institute of Open Schooling (NIOS) and State Open Schools for education at secondary and senior secondary level while Indira Gandhi National Open University and various State Open Universities for higher education. Morris & Ogan (1996) stated Internet as the new medium serving mass audience. They argued that it allows us 'to rethink and to find new insights into traditional communication technologies'. Hence to serve such group of non-admitted children, it would be pertinent to

envisage some sort of virtual open school where they can be provided opportunity to complete their education.

4. Virtual (or online) schools

To make most of what is available to them, institutions are examining alternatives to the exclusive face-to-face learning models. Internet has emerged as the most important medium of learning and exchanging new information through various resources, including social networks. There is a steady rise in the number of face-to-face/online hybrid learning models and thus equipping students with digital skills. Such models empower students to learn at their own pace, time and place convenient to them. Internet is enabling learning anytime, anyplace. Emergence of virtual (or online) schools is one such phenomenon as a result of such paradigm shift. Virtual schools may be described as schools where students can learn and carry out tasks online as they would have done them in a regular classroom.

5. Defining a virtual institution

Wilson (1996) describes the virtual institution as “one which loses much or its entire geographical locus (geographical virtuality) ...and (it) makes the best use of virtual capability.” Whittington (2000) defines the virtual education institution as anything that delivers education to students via the World Wide Web.

For our purpose this report defines Virtual Open Schooling (VOS) as an educational practice that provides opportunity to learners to study a formal school-based course online and gain credit for certification purpose. Learners can study using asynchronously and/or synchronously technologies. The courses are based on Open Educational Resources, and are built around a learning management system with content stored on online repositories and platforms. In order to facilitate the virtual open schooling, the formal structure may follow a consortium approach and form part of the existing National Consortium of Open Schools (NCOS) at NIOS. Thus, it is not to be considered as another open school, but a part of the national open schooling system that utilizes the existing structures.

6. The Proposal

It is proposed that the VOS would work as a consortium facilitated by NIOS through its NCOS. There shall be a common online platform from which all Open Schools would offer their programmes and courses. There may be a management committee represented by all participating Open Schools to decide rules, regulations, policies, practices and procedures etc about functioning of VOS. The system envisages the following:

- (a) open courses to be taken by students from anywhere
- (b) platform offers courses from any open school, and students may opt any course from any school
- (c) students join and undertake courses, and pay fees only at the time of assessment
- (d) open schools would offer credit transfer facilities to enable students to complete certification
- (e) Everything from admission to assessment would be online, including teaching-learning interactions. However, the assessment may take different forms, including some proctorial approaches.

6.1 Objective / Vision of Virtual Open School (VOS)

Establishing virtual open schooling in India would address the urgent need of expanding the education base at secondary and senior secondary level. It would integrate the facilities of physical institution with virtual learning environment to provide quality education on controlled expenses. The platform would be a blend of synchronous and asynchronous technologies as delivery mechanisms.

6.2 Funding Mechanisms

The funding of VOS may be determined in performance agreements as decided by the Central Government and the State Governments and NIOS/SOSs. There can be different models for funding:

- (a) The programmes can be subsidized by NIOS. The student pays nothing or a minimal amount at the time of registration. The course material would be provided to student free of cost. Student pays only at the time of taking up tests for certification.
- (b) Each Member Open School contributes. There can be a common pool of funding where each open school provide subvention for managing the operations of the virtual open schooling operations.
- (c) Fee sharing: Students are charged programme fee and that fee is shared among the members.

6.3 Technology for Functional requirements

Suitable technologies and tools would be employed to meet the requirement of different processes like admissions, course development, teaching-learning, administration, evaluation, feedback etc. Online technology would be integral to all these processes. Use of Open Source tools is recommended to save on costs. There are very effective tools like Moodle as learning management system (LMS) which is one of the most popular LMS globally, Wiki tools for collaborative content development, tools for audio-video interactive communication between teacher and students, rubrics for evaluation etc. are recommended to create the Virtual Open Schooling platform.

The Virtual Open Schooling platform would have a repository of course content, assignment materials, unit tests, Email, online chat, threaded discussions, audio and video conferences, as well as telephone, print and fax would facilitate asynchronous communications. The system suggested is an integrated platform of a suitable Open Source LMS, Media Wiki, virtual conference tools, and online student assessment system. However considering the present ICT use and penetration in open schools, a complete online assessment system can be in place at a later stage.

7. Plan of Action

Based on the feasibility study, the following action plan is recommended for consideration of CEMCA, NIOS and SOSs:

For CEMCA:

1. Engage in orientation of the staff (academic and technical) of NIOS and SOSs to develop skills on using online tools that may be used in VOS
2. Consider engaging a technical expert team to develop a platform that would integrate all the existing technological practices at NIOS and offer the same to be adopted by them for Virtual Open Schooling.
3. Assist NIOS and SOSs to develop courses for offer on the VOS platform. This can be done by transformation of the existing courses.
4. Engage through NCOS of NIOS to develop consensus and understanding about credit transfer and certification

For NIOS:

1. Upgrade the network and computer facilities at the HQ and the Regional Centres
2. Continuously train the staff to adopt ICTs, and deploy additional human resources that may be needed to support the platform.
3. Transform the existing courses to wiki-based open courses for adoption in the VOS platform.
4. Create a system for VOS contact centres all over the country to provide access to students. This can be done under PPP model without investment by NIOS.
5. Offer pilot courses on the platform, as soon as it is ready, and then deploy the system for all courses.
6. Promote the VOS through nationwide campaign for creating awareness

For SOSs:

1. Participate in the VOS platform actively.
2. Improve their ICT infrastructure, and develop courses for the platform.
3. Develop consensus with NIOS on credit transfer and certification.

Virtual Open Schooling in India

Feasibility Report

1.0 INTRODUCTION

When India achieved her independence in 1947, the Government of India considered deploying an alternative system of education (to the formal education) in the First Five Year Plan (1951-56) to address the increasing demand for education. Schooling in India comprises four stages: Primary, Upper Primary, Secondary and Higher Secondary. The Department of School Education & Literacy, Ministry of Human Resource Development, Government of India (2012), emphasizes the significance of secondary education in India:

"While Primary Education is a basic enabling factor for participation and freedom, for trading a life with dignity and overcoming basic deprivation, secondary education is the gateway for prosperity, for transforming the economy and establishing social justice in any country. It opens the world of work to the youth of the country and contributes to socio economic development of the Community. Secondary Education is a crucial stage in the educational hierarchy as it prepares the students for higher education and also the world of work. With the liberalization and globalization of the Indian economy, the rapid changes witnessed in scientific and technological world and the general need to improve the quality of life and to reduce poverty, it is essential that schools leavers acquire a higher level of knowledge and skills than what they are provided in the eight years of elementary education, particularly when the average earning of a secondary school certificate holder is significantly higher than that of a person who has studied only up to class VIII".

The 'Approach Paper to 12th Five Year Plan' of the Planning Commission, Government of India raised concerns over the low Gross Enrollment Ratio (GER) of 60 per cent at the secondary school stage (Classes IX–X). Since Universalisation of Elementary Education (UEE) is of top priority of the Govt, Universal Secondary Education (USE) has to be paid extra attention to accommodate those students coming out from UEE. Thus with the purpose to improve enrollment and quality in secondary education, the scheme of Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and the Scheme of Model schools were launched in the Eleventh Plan. In the 12th Five Year Plan the targets have been set to achieve a GER of 75% in secondary education by 2014 and universal access to secondary education by 2017.

As a result of various schemes or initiatives, India witnessed a big expansion of her educational system. However, if we look at the figures of population and enrolments in schools, the current mechanisms seem to be inadequate. There were 7416 secondary schools in 1950-51 in India which have grown to 59166 in 2007-08.

Table 1: Number of High/Higher Secondary institutions, Students and Teachers (1950-2008)

Year	High/ Higher Secondary Schools/ Inter / Pre-degree / Junior Colleges	Students (in lakh)	Teachers (in lakh)
1950-51	7416	15.0	1.27
1990-91	79796	191.0	13.34
1995-96	90134	249.0	14.93
1998-99	112438	277.6	17.47
1999-2000	116820	282.1	17.20
2007-08	172910	737.8	21.2

Source: Selected Educational Statistics, MHRD, various reports from 1999 to 2008

1.1 Universalisation of Secondary Education (USE)

As per the constitution of India, all children up to the age of 14 must be provided free and compulsory education. Different schemes have been introduced in successive development plans, a major thrust was provided by making adequate arrangements in National Policy on Education (1986 and modified in 1992). Along with other recommendations, it aimed at vocationalisation of secondary education and greater use of educational technology. Another boost to these efforts came by launching of District Primary Education Program (DPEP) in 1994 and the National Campaign for Education for All (Sarva Shiksha Abhiyan) launched in 2001. Special focus is on Universalization of Secondary Education (USE) where the target is to increase access to high quality secondary education to children up to the age of 16 by year 2015 and senior secondary education up to the age of 18 by the year 2020.

12th Plan Vision for Secondary Education
Making good quality education available, accessible and affordable to
all young persons in the age group of 14-18 years.

To make provisions for universal access to secondary education and senior secondary education, Central Advisory Board of Education (CABE) constituted a sub-committee in 2004 with a responsibility of preparing a blueprint for the universalization of secondary education consequent upon the attainment of universalisation of elementary education. This sub-committee recommended that 'The guiding principles of Universal Secondary Education should be universal access, equality and social justice, relevance and development, and structural and curricular considerations'. To realize recommendations of CABE sub-committee and the universalization of access to and improvement of quality at secondary stage, the Ministry of Human Resource Development introduced the "Framework of implementation of **Rashtriya Madhyamik Shiksha Abhiyan**" in 2009. This framework presents a road map for the implementation of access and equity as envisioned in USE and sets norms for infrastructure requirements. RMSA Framework puts forward that "The vision for secondary education is to make good quality education available, accessible and affordable to all young persons in the age group of 14-18 years" (RMSA Framework,

MHRD, 2009). The vision statement under RMSA lays greater stress on three A's which are Availability, Accessibility and Affordability of secondary education to the target group.

The Working Group on Secondary and Vocational Education for the 11th Five Year Plan (2007-2012) pointed out certain challenges of secondary education like lack of access, low participation, equity and quality issues. It further reported that on an All India average there are only 4 secondary and higher secondary schools per 100 sq. KM area, which becomes worse in case of large States like Bihar, Uttar Pradesh, Rajasthan, Madhya Pradesh, Chhattisgarh and Jharkhand where the numbers are less than national average.

For secondary education, the following schemes were operational in the 11th Plan:

- (i) Kendriya Vidyalaya Sangathan (KVS)
- (ii) Navodaya Vidyalayas (NVS)
- (iii) Central Tibetan School Administration (CTSAs)
- (iv) National Institute of Open Schooling (NIOS)
- (v) Rashtriya Madhyamik Shiksha Abhiyan (RMSA)
- (vi) Model Schools
- (vii) Scheme for Construction and Running of Girls' Hostels for Students of Secondary and Higher Secondary Schools
- (viii) Information and Communication Technology in Schools (ICT @ Schools)
- (ix) Inclusive Education for Disabled at Secondary Stage (IEDSS)
- (x) National Means-cum-Merit Scholarship
- (xi) National Scheme of Incentive to Girls for Secondary Education
- (xii) Centrally Sponsored Scheme of Financial Assistance for Appointment of Language Teachers
- (xiv) Environment Orientation to School Education (EOSE)

According to the Mid Term Appraisal of the 11th Five Year Plan (2007-2012), there is an urgent need of:

- Strengthening 44,000 existing secondary schools
- Opening 11,188 additional secondary schools (through up-gradation of upper primary schools)
- Appointing 1.79 lakh additional teachers and
- Constructing 80,500 additional classrooms.

2.0 OPEN SCHOOLING

Open schooling is an alternative to the main stream educational channels where educational opportunities (courses and programmes) are provided at primary or secondary level through distance education mechanisms. The reasons for going in for open schools may vary, for example, the Correspondence School in New Zealand (1922) was established to allow access to education to remote farming communities. In India and Nigeria open school was established to allow access to education to those who were not attended to by the mainstream schooling system. In Botswana and Namibia these were established to cater to increasing numbers of out of school youth. Based on varied reasons, open schools have been defined in various ways.

Phillips (2006) defined open schooling as ‘the physical separation of the school-level learner from the teacher, and the use of unconventional teaching methodologies, and information and communications technologies to bridge the separation and provide the education and training’.

The Commonwealth of Learning (COL) (cited in Rumble & Koul, 2007, p.9) interprets that Open Schooling involves "the physical separation of the school-level learner from the teacher, and the use of unconventional teaching methodologies, and information and communications technologies (ICTs) to bridge the separation and provide the education and training". COL has an explanation for arriving at this definition. It asserts that:

"Open Schooling is not called open/distance schooling for a reason. Open Schooling may follow different patterns, but the most common scenario is that the learners study specially designed open learning materials on their own - at home, in their workplace, wherever it is convenient for them - and then they meet together with a facilitator on a regular basis. The "open" in Open Schooling refers to the openness of the system - seldom are there rules dictating student ages, prerequisites, content of courses to be taken or number of courses in which students must enrol. For example,

- Youth that missed out on schooling in their childhood can enrol in courses which will provide them with the equivalence of secondary education without their having to endure the embarrassment of being in classrooms with children much younger than themselves.
- Young mothers can take secondary level education through studying at home, and attending tutorials only when necessary and their responsibilities permit.
- Working adults can enrol in one or two courses at a time, and study whenever their personal and work commitments permit.
- Young adults can acquire skill training coupled with academic subjects while self-employed or working as non-skilled labour”. (cited in Rumble & Koul, 2007, p.9)

The NIOS (n.d.) also favours this definition of Open Schooling System as the system to provide education to those who could not attend conventional schools for a variety of socio-economic reasons, as well as to those who missed opportunities to complete school education and developmental education.

Du Vivir (2009) explained Open schools as “institutions that provide education through open and distance learning methods” at the school level.

Jenkins and Sadiman (2000) also hold similar views and indicate that these provide prospects outside the format of traditional educational system, “This may be achieved through special institutions — “open schools” — or through the use of the techniques of distance education to extend opportunity for schooling to those otherwise excluded” .

Jenkins (2003) highlighted the features of open school as they offer the opportunity to:

- teach children out of school;
- provide adults with school-level learning; and
- extend the range of learning for pupils in schools.

From these definitions of Open Schools, it can be elucidated that these are an excellent gateway to offer learners a chance to learn while earn. These can be a boon to the dropouts and to those who could not get admission to regular schools due to their socio-economic circumstances. Not only that, open schools suit the requirements of learners with slow learning capacities. The very basic organizational and managerial structures of open schools are suitable for places with difficult terrain or harsh climate, for skills training for non-skilled labour or young mothers improving their educational levels. Open schooling is therefore a

concept providing flexible learning opportunities at the school level, and also a pedagogical practice that uses technology-mediated distance education for delivery of teaching and learning.

Daniel (2009) in his speech during the 17th Conference of Commonwealth Education Ministries at Kuala Lumpur, while speaking on "Expanding access - Universal Secondary Education: The Contribution of Open Schooling", highlighted the failure and success of EFA campaign. The reasons cited by him seem to be equally applicable to India as elsewhere. He reported about the challenge to "push for Universal Primary Education (UPE), knowing that the children still out of school will be, for reasons of location and marginalisation, more difficult and expensive to reach than those already in school." To meet out this challenge, he advocates the option of establishing open schools...

"...Countries that have struggled to achieve Universal Primary Education will not be able to achieve Universal Secondary Education by building conventional schools. The sums simply do not add up to any remotely realistic budget scenario. To make progress governments must stop thinking of their role primarily as providers of secondary education and pay more attention to the facilitation and regulation of other providers. Private provision has an important role to play, not least in poorer communities, and open schools are an important option. The Commonwealth of Learning believes that open schools can not only expand access to quality secondary education very cost-effectively, but can also play a synergistic role in raising the quality of other providers by acting as a source of learning materials and a mechanism for introducing ICTs effectively for the secondary system as a whole."

Currently open schools are in operation all over the globe, especially in those countries where educational systems are targeted to increase access to school level basic education. Open Schools have received higher attention due to advances in distance education technologies and practices around the world, and recognition by governments to take benefit from open schooling system to democratize education to millions. Moore and Kearsley (1996) revealed that in 1906 a primary school was established in the United States to register students to learn via correspondence. Mukhopadhyay (1994) reported the opening of first open school in 1914 in Australia when the Victorian Education Department made provisions for education of home learners which later on in 1951 lead to the establishment of Australian Schools of the Air when radio was introduced for teaching purposes. Reports are there for the opening of open schools in Canada in 1919 and in New Zealand in 1922, to mention a few are as hereunder:

- New Zealand Correspondence School (1922)
- Open Junior Secondary School, Indonesia (1979)
- Malawi College of Distance Education (1988)
- National Institute of Open Schooling, India (1989)
- South Korean Air Correspondence High School (1992)
- Bangladesh Open School (1997)
- Namibian College of Open Learning (1997)
- Botswana College of Open and Distance Learning (1998)

Advantages of Open Schools:

- augment access to remote communities
- serve large number of out of school youth
- offers solution to low access and low efficiency of conventional secondary schooling
- offers flexible and diverse range of educational practices
- provide basic education to marginalized sections like migrant workers, girl-child, women, in addition to illiterate adults, drop-outs etc

Dewal (1990) reported that “ in India, an Open School was set up in 1979 to meet the frustrated demand for secondary education, and to provide opportunities to disadvantaged sectors of society such as girls, women, and working adults”.

2.1 Open Schooling in India

Open Schooling was conceptualized in India in 1978 as a project under the Central Board of Secondary Education (CBSE). Later on the Ministry of Human Resource Development (MHRD), Government of India established the National Open School (NOS) in 1989 to cater to needs of learners wanting secondary and senior secondary along with vocational education. The mission of NOS was to contribute to ‘education for all’, ‘greater equity and justice in the society’, and ‘the evolution of a Learning Society’. In July 2002, the NOS was renamed as the National Institute of Open Schooling (NIOS). The learning opportunities are extended to the learners at Accredited Institutions (AIs) for Academic Courses, Accredited Vocational Institutions (AVIs) for Vocational Education Courses and Accredited Agencies (AAs) for Open Basic Education (OBE) courses spread through length and breadth of the country. India is the largest democracy in the world and population-wise stands next to China with more than 1.2 billion population. Thus we needed a system to that magnitude to create access to basic education for masses, also as envisioned during Jomtien World Conference on 'Education for All' in 1990. Owing to its capability to serve large masses, NIOS has become the largest open school system in the world. Rajagopalan (2011) identified that India being such a large country with so much of diversity, it is imperative to have State Open Schools in different parts of the country, because “...It is well-nigh impossible to realise the laudable goal of EFA and universalisation of school education through the formal education system alone or through the National Open School in the Country’s capital Delhi. The needs of several regions must also be taken care of.” Currently in addition to NIOS, there are Open Schools (SOS) in 17 states of India, viz., Rajasthan, Andhra Pradesh, Madhya Pradesh, Punjab, Tamil Nadu, West Bengal, Haryana, Karnataka, Kerala, Jammu & Kashmir, Uttar Pradesh, Assam, Chhattisgarh, Delhi, Himachal Pradesh, Gujarat and Bihar.

NIOS provides opportunities for continuing education to those who missed completing school education. In 2009-10, 419702 lakh students were enrolled at the secondary and senior secondary stages through 11 Regional Centres, 1943 accredited institutions for academic courses, and 1002 accredited vocational institutions (AVIs) for programme delivery through open learning and distance learning. NIOS centres have also been set up in UAE, Kuwait, Nepal, and China.

2.2 ICTs in Open Schools

Information and Communication Technology has greatly affected all walks of our life: be it health, business, defence, communications, governance and education etc. India has witnessed tremendous progress in the field of telecommunications, Internet, television expansion and radio network. Govt of India has supported and promoted use and adoption of ICT in education sector in a big way. Very recently the Govt has planned to provide low cost tablets to teachers and students. This, coupled with other ICT tools and applications has fuelled the growth of ICT in education.

The National Knowledge Commission (NKC), a high level advisory body to the Prime Minister of India, laid great stress of transforming India into knowledge society. It emphasized on five key areas of the knowledge paradigm – access to knowledge, knowledge concepts, knowledge creation, knowledge application and development of better knowledge services. Taking into consideration, the higher education sector NKC has supported development of open and distance education and open educational resources to achieve expansion, excellence and inclusion. This recommendation has its implications for secondary education as well and thus role of ICT.

The National Policy on information and communication technology (ICT) in School Education (revised in 2012) by the Department of School Education and Literacy, Ministry of Human Resource Development, Government of India lays a greater emphasis on educational technology to improve the quality of education (2012). National Curriculum Framework 2005 (NCF), and the report on Universal Secondary Education (2005) of the Central Advisory Board of Education (CABE) have also expressed seriousness on the use of ICT for up gradation of educational standards in India. The National Policy on ICT in School Education envisions "...The ICT Policy in School Education aims at preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socio-economic development of the nation and global competitiveness."

National Institute of Open Schooling (NIOS) by virtue of its nature of providing educational opportunities to large masses up to pre-degree level courses has adopted ICT. Pant (n.d.) advocated the use of ICT to meet the challenge of reaching the unreached, "...The challenge of "reaching the unreached" can be met if the national governments provide flexible and viable system of open learning along with the formal schooling programme. The increasing use of Information and Communication Technology (ICT) will enable the developing countries to meet the challenge of educating the increasing number of prospective learners. In order to meet the challenges posed by multiple revolutions in science and technology, commerce and industries, ICT and in several other fields of life, it is imperative that responses need to be provided through multi-model schooling system, adopting multi-media approach including open learning, distance education, ICT based learning programmes, contact classes, peer learning, self-study and, more importantly, learning of requisite skills."

Ambasht (n.d.) in his address, "open schooling in India: a challenge to technologies for learning and training" worries about the challenge of how to reach the child in remote rural and tribal areas directly? Daniel (2009) offered the solution: open schools to use technology!

Technologies in the form of radio, television, audio and video cassettes have been introduced to extend the outreach of open education programmes. Subsequently, computers were also put to use for academic and administrative purposes. Along with universities in other countries (Paul and Brindley, 2008), India also jumped to take advantage of the advent of Internet in 1996 and thus institutions switched to networked learning (Sharma, 1999, 2001; Mishra and Sharma, 2005). Internet being a powerful medium for collaboration and communication in education, it offers a global open platform for information storage, display and communication and integrates text, graphics, audio and video with communication tools such as email, bulletin-boards and chat-rooms to promote synchronous and asynchronous one to one, one to many and many to many interaction / conferencing. Like elsewhere, in India too, e-Learning has gained momentum and thus many higher education (traditional and open distance) systems are offering courses via Internet (Sharma and Mishra, 2007).

3.0 VIRTUAL SCHOOLS

In their research report 'NMC Horizon Report - 2012 K-12 Edition' the New Media Consortium (NMC) in association with the Consortium of School Networking (CoSN), and the International

Society for Technology in Education (ISTE) examined and listed top emerging technologies, trends, and challenges that have a major impact on teaching, learning, and creative inquiry in pre-college education over the next five years. In its report the NMC identified some key drivers of educational technology adoptions for the period of 2012 through 2017. They report that most important key driver is that the education paradigms are shifting to include online learning, hybrid learning and collaborative models. The institutions all over the globe are facing financial resource crunch. To make most of what is available to them; schools are searching for alternatives to the exclusive face-to-face learning models. Internet has emerged as the most important medium of learning and exchanging new information through various resources, including social networks. There is a steady rise in the number of face-to-face/online hybrid learning models and thus equipping students with digital skills. Such models empower students to learn at their own pace, time and place convenient to them. Internet is enabling learning anytime, anyplace.

Emergence of virtual (or online) schools is one such phenomenon as a result of such paradigm shift. Virtual schools may be described as schools where students can learn and carry out tasks online as they would have done them in a regular classroom. The International Association for K-12 Online Learning (iNACOL) reported that in United States 40 states have state virtual schools or state-led initiatives (Watson, 2011). Queen & Lewis (2011) estimated that in 2009 – 2010 there were around 1,816,400 enrollments in distance-education courses in K-12 school districts, almost all of which were online courses (74% of these enrollments were in high schools). However this estimate does not include students enrolled in most full-time online schools which were approximately 200,000 students in 2009-2010 and 250,000 students in 2010 – 2011 (Watson, 2011). This is surely an excellent growth when compared to around 40,000-50,000 enrollments in K-12 online education a decade ago (Clark, 2001). Queen & Lewis (2011) think the reasons for success of such online learning opportunities lies in the attempt by school districts in providing courses which are otherwise not available at their schools. Further the students can recover course credits from classes missed or failed.

3.1 Funding of Online Learning

As per iNACOL report 2012, different states in US have different approaches for funding of Virtual schools. Funding is generally based on the number of students enrolled in states having schools offering full-time online learning. Let's see some of the examples:

Table 2: Funding mode/extent of Online Learning

Name of State	Mode / Extent of Funding
Arizona online schools	full-time online schools receive 95% of the base support-level
Colorado online schools	funds full-time online schools at a state, per pupil minimum level for online students
Florida online schools	full-time online schools receive funding for students based on successful completion
Indiana online schools	funding for full-time online schools receive 87.5% of the typical funding level
Louisiana online schools	receive 90% of the state and local funding based on where the student resides
Nevada virtual schools	receive the same level of funding as brick-and-mortar schools
Minnesota virtual schools	Receive funds full-time online learning the same as if the students were taking all of their courses in a physical classroom

3.2 Benefits of Virtual Schools

Virtual schools are beneficial in the following manners: they offer

- Personalized, tailored content: suited to individual learning
- Flexibility: Anywhere Anytime access, students can enrich their skills in learning a new subject or take up a course or class normally not available at their schools
- Lower costs: Saves on permanent infrastructure costs
- Access to high quality education: Access to quality teachers and peers, increases collaboration

3.3 Cases of Virtual Schools Around the World

This section presents cases of virtual schools from different countries. Let's discuss some of them as hereunder:

AFRICA

The African Virtual School (<http://www.africanvirtualschool.com>)

The African Virtual School is a virtual school set up to help students in West Africa pass exams. It does this by helping them revise using quizzes and videos online. This means that they can revise Maths and English anytime and anywhere. The exam revision courses are suitable for Junior and Senior Secondary students, focusing on the WAEC (West African Examinations Councils), NECO (Nigerian National Examinations Council) and JAMB (Nigerian Joint Admissions and Matriculation Board) Maths and English Exams. Schools from Nigeria, Sierra Leone and Ghana subscribe at approximately \$20 per learner year.

KOREA

The Korean Air & Correspondence High School

(http://www.nytimes.com/2011/02/22/technology/22iht-broadband22.html?_r=4)

The Korean Air & Correspondence High School is the largest online programme in Korea. A federally-funded initiative, the 39-year old program serves the nation's youth and adults who couldn't get a diploma because they were forced to work in the factories to support their families or because they could not afford to pay for high school (students pay to go to most high schools in Korea). The name Air & Correspondence comes from their early days when they used radio to deliver their lessons and mail to exchange student work. Since their beginning, they have taught over 300,000 students and currently have 15,000 students enrolled this year.

TURKEY

Open High School Turkey (<http://maol.meb.gov.tr>)

The Open High School Turkey (OHS Turkey) supports e-learning interactive distance education by making use of a three dimensional approach to learning materials. It makes use of the following:

- Printed educational materials
- Education through the media
- Face-to-face teaching

These three different approaches to teaching materials make use of the following technologies: printed materials, radio and audio cassettes, telephone and fax, audio conferences, video conferencing, computer, Internet and web conferencing.

The Open High School's main office is situated in Ankara, Turkey. It has other campuses in different parts of the country. It was established in 1992 within the department of Film, Radio and Television Training. Its mission is to promote equal opportunities for education for all, making use of cutting edge information and communication technology. It also saw as its mission to bridge the gap between the knowledge of technologies used at school and those used in the professional and industrial environment.

AUSTRALIA

Grampians Virtual School (GVS) (<http://grampiansvirtuelschool.wikispaces.com/>)

Grampians Virtual School (GVS) (Wimmera Virtual School (WVS), Victoria Australia) is a consortium of schools in Victoria, Australia which provides virtual education in specific strands such as Physics, Psychology, Mathematical Methods, Chemistry and Physical Education, to remote students who can follow a face-to-face class in a school through video conferencing.

UNITED STATES OF AMERICA

Florida Virtual School (<http://www.flvs.net/Pages/default.aspx>)

Florida Virtual School (FLVS) is an established leader in developing and providing virtual Kindergarten – 12th grade education solutions to students nationwide. A nationally recognized e-Learning model, FLVS was founded in 1997 was the country's first state-wide Internet-based public high school. FLVS offers more than 120 courses-including core subjects, world languages, electives, honors, and 15 Advanced Placement courses. FLVS courses are accepted for credit and are transferable. FLVS has over 1,800 staff members who reside throughout Florida and beyond. FLVS served over 148,000 students in 303,329 half-credit enrollments in the 2011-12 school year. Enrollment is free and open to public, private, and home school students in the state of Florida. Students outside Florida enroll on a tuition basis.

Open High School of Utah (<http://www.openhighschool.org/>)

The Open High School of Utah (USA) is one of the best examples of providing "one-to-one tutoring for every student in every subject". It is a tuition-free public charter school. The School does not charge any fee for attendance, other than some nominal fee at the beginning of the year. The students here work and learn at their pace via individualised instruction. Instructional delivery of the school is student-centric, addresses individual needs of each one as they do not believe in "one size fits all" approach. Its mission is "to use innovative technology, service learning, student-centered instruction and personal responsibility to empower students to succeed". The school serves the students with varied profiles, like, athletes who travel and compete nationally and globally; students who benefit from one-on-one tutoring and individualized instruction; professional actors and dancers; students with chronic conditions, such as migraines; students who are parent caretakers or who need to work during the day; home schooled students; and students whose families travel extensively etc. It offers courses in Mathematics, Science, Languages Arts, Health, Computer technology, Fine Arts, Social Studies, Global languages and some electives. One of the interesting features here is that the courses and course materials produced by the Open High School of Utah are licensed under a Creative Commons Attribution 3.0 License. It has technology partners to support its online programmes, like Google Apps for Education {as Communication and Collaboration tools}, Moodlerooms {as Learning Management Systems provider}, Slidrocket {as web-based presentation software} and Voicethread {as collaborative multimedia slideshow} among others.

Virtual School British Columbia (<http://www.virtualschoolbc.ca/>)

It offers free British Columbia Ministry of Education approved school courses to students age 15 or older who live in Greater Vancouver and are Canadian Landed Immigrants or Canadian Citizens. International Students may also take its courses. The course fee is \$650 CDN. The students have a variety of goals. Some want to complete high school. Others are graduates who want to satisfy the prerequisites for a college or university programme. Still others want to better their English skills before they move on.

These representative samples of the virtual schools from around the globe reveal some unique features. Open High School of Utah, USA, offers 'one-to-one tutoring for every student in every subject'. These virtual schools target to facilitate individualised learning and to meet the needs of 21st century students. Using innovative technology they offer tailor made flexible curriculum. They may be free or charging fee. They provide a variety of content material to the learners like textbooks, study guides, science kits, and electronic gadgets depending upon needs of curriculum. Operations wise virtual schools are mostly state owned, while others are college or university based, consortium based, public charter schools, local education agency based, private virtual schools, and for-profit virtual schools etc. Flexibility is another feature of most of the virtual schools allowing students to decide the study schedule as per their convenience and pace.

As like elsewhere, the today's Indian learners can also be labeled as Net Generation (Tapscott, 1997), Millennials (Howe & Strauss, 2000), Digital Natives (Prensky, 2001), or Multi-taskers (Barbour, 2009). Above mentioned features of virtual open school are quite suitable and relevant to such 21st learners of India. These features can be easily built into an Indian model of virtual open schooling. Being virtual travelling to attend face to face classes can be avoided. Digital media integration would facilitate effectiveness of curriculum. Synchronous and asynchronous technologies would facilitate interaction - with peers, with teachers, and with content!

4.0 EMERGING TRENDS IN TECHNOLOGY USE IN EDUCATION

Course Management Systems or Learning Management Systems (CMS / LMS)

These systems allow teachers to organise their content online via digital resources so that they can put their courses online. Students participate in the instructional process by accessing reading materials, multimedia content, attempting assessment exercises, participating in discussion forums etc. These can be propriety software (like Blackboard) or open source (like Moodle or Joomla).

Cloud Computing

In cloud computing a user uses computing resources over the Internet. Here the user is offered remote services in terms of data, software and computation. The advantage is accessing data from anywhere; there is no need to install applications on user-machine and sharing of resources. Google applications is one of the example of cloud computing.

Massive Open Online Courses (MOOCs)

According to Wikipedia, A massive open online course (MOOC) is a category of online course where the participants are distributed and course materials also are dispersed across the web. The term Massive Open Online Courses (MOOC) was coined by Dave Cormier and Bryan Alexander. These are courses that

- Take place online
- Are typically free of charge
- Use learning materials can be modified, re-used, and distributed to others
- Reach thousands of learners at once

MOOCs are being launched by many reputed institutions like MIT, Harvard, Georgia Tech, and Stanford etc. MOOCs are famous for this massive outreach to thousands of participants. When we design a MOOC we have a start date and end date. The course contains content, collaboration and assessment. But it is much more than mere collection of content, it is more about sharing of experiences.

Open Badges

This is a project of Mozilla (<http://www.openbadges.org/en-US/>) where meaningful assessment, certification and recognition of learning is the core of Open Badge Infrastructure. Work is being done by The Mozilla Foundation (<http://www.mozilla.org/foundation/>), the MacArthur Foundation (<http://www.macfound.org/press/press-releases/badges-lifelong-learning-competition-winners-announced/>), Peer 2 Peer University (<http://p2pu.org/en/>), and others on developing a system of portable online “badges” that would help learners to demonstrate and share evidence of what they have learned in informal or formal settings. By awarding badges we acknowledge skills that children have gained themselves both in and out of school. The badges will not only be used by teachers to award children for their skills, learning and understanding but also by the children themselves. Additional badge awards can be gained from peers and by the children themselves on successful completion of additional skill sets (as described by the child and their peers).

The advantage of badges is that it helps in community recognition, looking for a job or some new learning opportunity, which sometimes does not reflect from traditional degrees or transcripts. The working here is simple. Any badge issuer (for example, a vocational institute or free online course) awards a badge to the learner who has completed the course. These badges can be displayed in our CV, personal website, social networking sites etc. These badges tell about your skills and competencies to prospective employers too.

Open Courses

Open courses are no-cost online learning environments where we can have access to course materials, communicate with teachers or peer students, and monitor performance. Being online these are available anytime anywhere via Internet. There are many universities which offer open courses. In India, NPTEL and IGNOU also offer such courses.

- MIT OpenCourseWare site and course materials (<http://ocw.mit.edu/index.htm>)
- Open Yale Courses (<http://oyc.yale.edu/>)
- Harvard Open Courses: Open Learning Initiative (<http://www.extension.harvard.edu/open-learning-initiative>)
- FlexiLearn - Indira Gandhi National Open University (www.ignou.ac.in)
- National Programme on Technology Enhanced Learning (NPTEL) (<http://nptel.iitm.ac.in/index.php>)
- CourseSites Open Course Series (<https://open.coursesites.com/>)
- UK Open university (<http://openlearn.open.ac.uk/>)

Open Educational Resources

These are defined as “the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for noncommercial purposes” (Johnstone, 2005). The term open educational resource was first used during a conference hosted by UNESCO in 2002. UNESCO defines OER as "OERs are teaching, learning or research materials that are in the public domain or released with an open license that allows for free use, adaptation, and distribution." Another definition of OER is: “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”.

There are two important declarations on OER:

2012 Paris OER Declaration: On Friday 22 June, the World Open Educational Resources (OER) Congress released the 2012 Paris OER Declaration which calls on Governments to openly license publicly funded educational materials.

Cape Town Open Education Declaration: Unlocking the promise of open educational resources (<http://www.capetowndeclaration.org/read-the-declaration>)

Some of major organizations, companies, and institutions offer OER using CC licenses are:

- MIT OpenCourseWare (<http://ocw.mit.edu/>)
- Khan Academy (<http://www.khanacademy.org/>)
- CK-12 Foundation (<http://www.ck12.org/>)
- OER Africa (<http://www.oerafrica.org/>)
- Curriki (<http://curriki.org/>)
- Connexions (<http://cnx.org/>)
- Bloomsbury Academic (<http://www.bloomsburyacademic.com/>)
- Flat World Knowledge (<http://www.flatworldknowledge.com/>)
- Peer 2 Peer University (P2PU) (<http://p2pu.org/>)

4.1 Case Studies

OER University: (http://wikieducator.org/OER_university/Home)

The OER University aims to provide free learning to all students worldwide using OER learning materials with pathways to gain credible qualifications from recognised education institutions.

Aims: The OER university collaboration with its anchor partners aims at:

- to design and implement a parallel learning universe to provide free learning opportunities for all students worldwide with pathways to earn credible post-secondary credentials.
- Offer courses and programs based solely on OER and open textbooks.
- Design and implement scalable pedagogies appropriate for the OER university concept.
- to implement scalable systems of volunteer student support through community service learning approaches.
- To coordinate assessment and credentialising services on a cost recovery basis for participating education institutions to ensure credible qualifications and corresponding course articulation among anchor partners.

The OER university concept aims to create a parallel learning universe based solely on OER to augment and add value to the formal education sector.

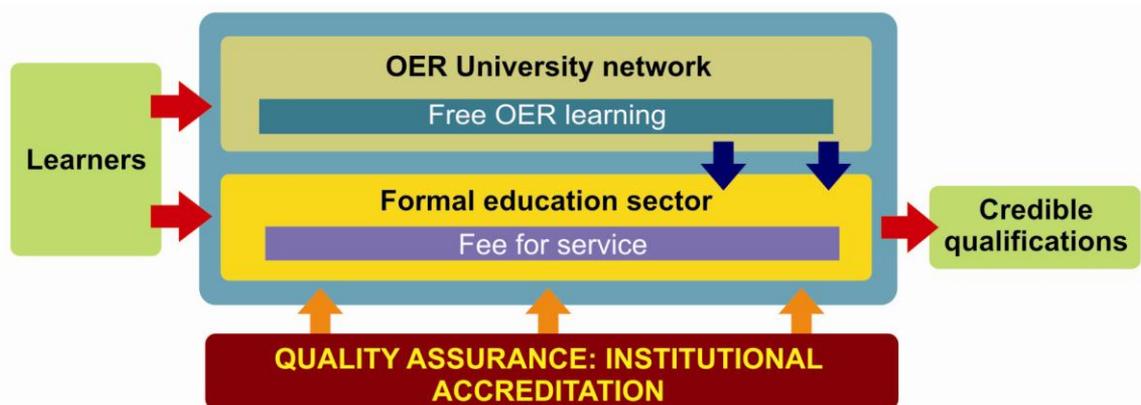


Figure 1: Logic Model of OER University

Source: http://wikieducator.org/OER_university/Logic_model

Learners may choose to enroll at formal education institutions in the traditional way or participate in free learning provided through the OER university network. Assessment and credential services will be provided by participating institutions on a cost-recovery basis or may be funded through scholarships or grants from the respective Ministries of Education.

Coursera (<https://www.coursera.org/>)

Coursera is a social entrepreneurship company that partners with the top universities in the world to offer courses online for anyone to take, for free. Through this platform, the teachers can teach tens or hundreds of thousands of students. The courses offered pertain to a vast range of disciplines like Humanities, Medicine, Biology, Social Sciences, Mathematics, Business, Computer Science, and many others. These courses are designed based on sound pedagogical foundations enabling learners to learn the content quickly and effectively.

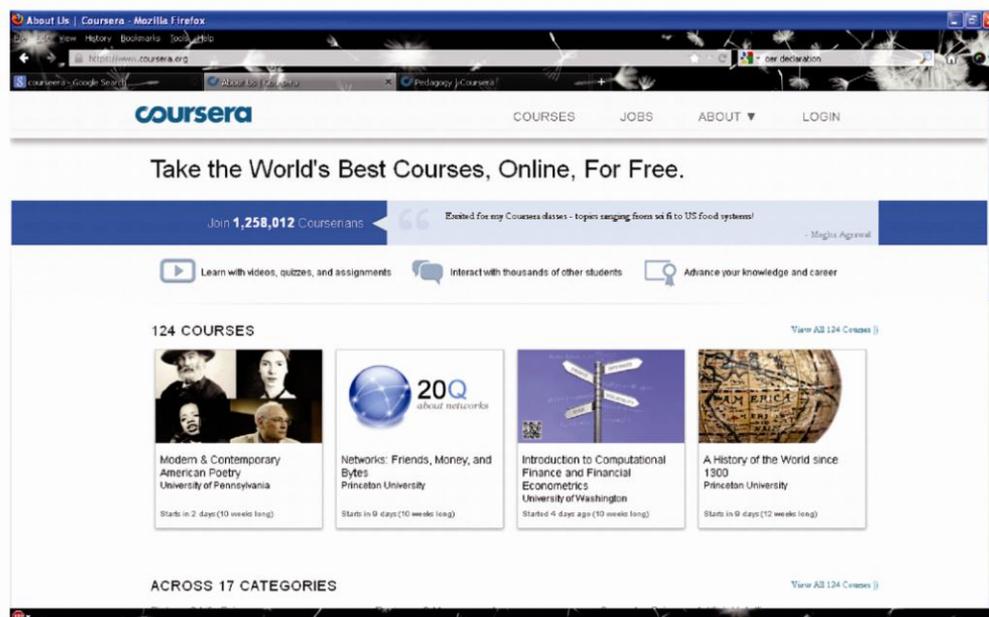


Figure 2: Screenshot of Coursera

There is an extensive use of interactive exercises, which are critical for student engagement and learning. The courses ensure long-term retention of content and reconstruct knowledge. The emphasis here is on Mastery Learning by providing immediate feedback on that concept the student did not understand. Another feature is peer assessments, where students can evaluate and provide feedback on each other's work. Having inbuilt active learning and interactive engagement between faculty and students, and between students and their peers, courses of Coursera platform become more interactive and engaging.

edX (<https://www.edx.org/about>)

edX is a joint venture of Harvard University and the Massachusetts Institute of Technology as a non-profit enterprise. Here learning is enabled through interactive study over the web. The mission of edX is to reach out to students of all ages, means and nations. To achieve this mission, an open-source online learning platform is being built by edX.

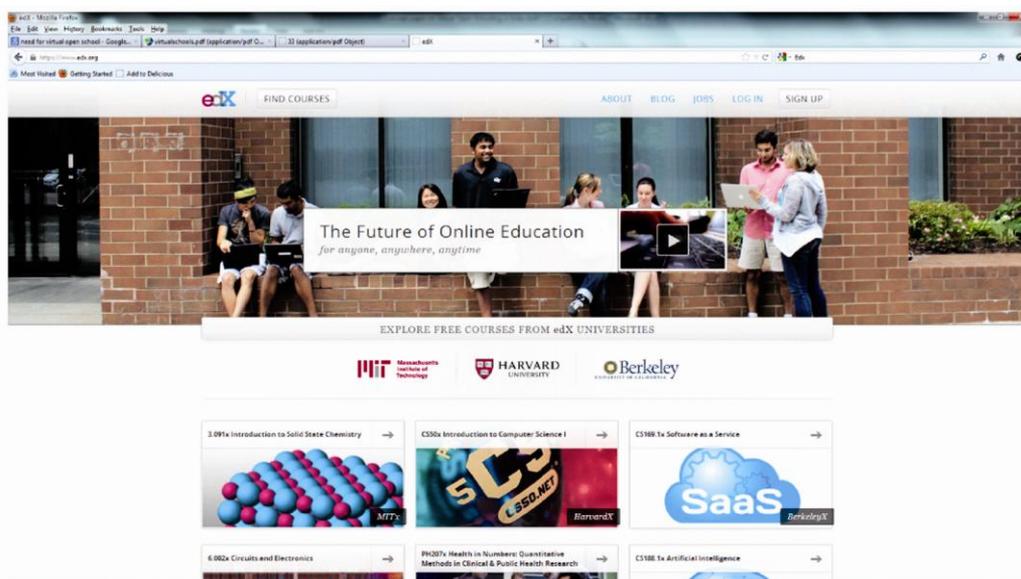


Figure 3: Screenshot of edX

Currently HarvardX, MITx and BerkeleyX classes are free. In addition to this with the purpose to understand how students (of on-campus and online both) learn and how technology can transform learning, Harvard, MIT and Berkeley are carrying out a research. edX courses are available free of cost to anyone in the world with an internet connection. There is no admission process. Certification will be provided to those who will achieve mastery of subjects on offer. edX via its open source online learning platform uses: self-paced learning, online discussion groups, wiki-based collaborative learning, assessment of learning as a student progresses through a course, and online laboratories and other interactive learning tools.

Udacity (<http://www.udacity.com/>) has the tagline of "21st Century University".

Udacity established in 2011 by Sebastian Thrun, David Stavens and Mike Sokolsky believes in advocating democratizing education by educating students across the globe. The mission of Udacity is to bring accessible, engaging and effective higher education to the world. The team at Udacity believe that higher education is a basic human right, and wish to empower students to develop their skills in order to advance their careers by offering Beginning, Intermediate, and Advanced Courses which are 100 % free!

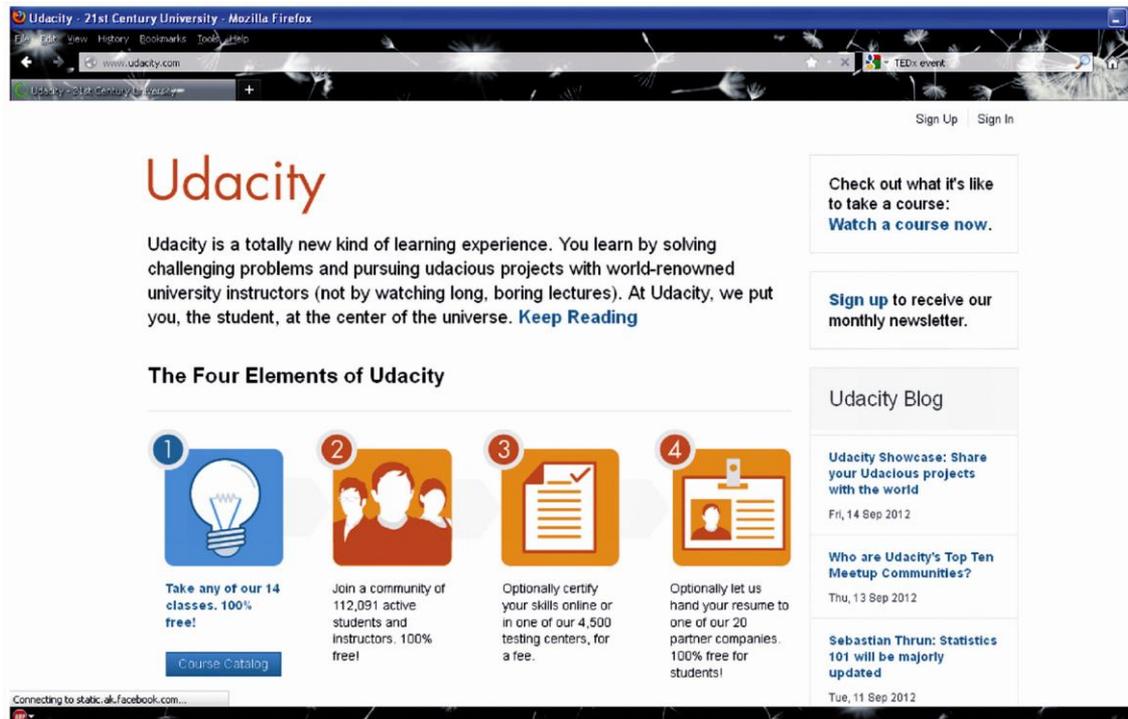


Figure 4: Screenshot of Udacity

All of our courses are open, anyone can sign up anytime and complete the course. The students can get a certificate at any time after a classes' final has been posted.

From these global trends in the use of ICT in education, it is clear that the trend is more towards online, open and courses which can serve large numbers. Some of them are free of cost to the learners. Some courses are jointly launched by institutions. Successful candidates are awarded certification too. Social networking, mobile technologies, and cloud computing have become mainstream with education industry. Tablets and smartphones have provided new avenues to teachers and learners. New business and revenue models are being created centered around enterprise communication, cloud computing, data analytics, virtualization, social networking, and context-aware apps. Education is not what it was last decade. Technology solutions are devising ways to improve processes and products. Gartner (Gartner.com) highlights that low cost industrialized services are the new players in the market. They predict that cloud computing, social media and social networking, mobility and information management are all evolving at a rapid pace. Keeping in view the Indian context, an integration of OERs, MOOCs and OpenBadges can be a useful model for Virtual Open Schooling. There is a need to develop appropriate pedagogical approaches to massification of education, reduce cost concern through economies of scale and consortia models, and provide certification for knowledge and skills online. Social mobility of the population and increasing numbers of learners waiting to enter secondary or higher education calls for a model where with the help of technology information is disseminated to masses and is available to them when needed. Formal system is already under pressure to respond to needs to mobile society who are more digitally enabled. Open access, open content, open licensing, open education practices and open education resources seem to open new frontiers for teaching and learning. There are already examples of use of open content and open technology approach though initiatives such as OER University, Udacity, edX amongst others.

4.2 Model for Offering Online Programmes in Open Schools

Virtual education is altogether a different experience for administrators, teachers, students and institutions. Past experiences have shown that during the ear of dotcom boom, many of the individuals and institutions went online. Teachers and teaching institutions were not far behind. However, merely moving from face-to-face settings to putting information, prospectus, course syllabus, lecture notes, video lessons etc does not make it as a sort of online or virtual institution. There are pedagogical considerations and great deal of planning and instructional design to go into it for an individual or institution to offer a high quality course.

Transformational Model

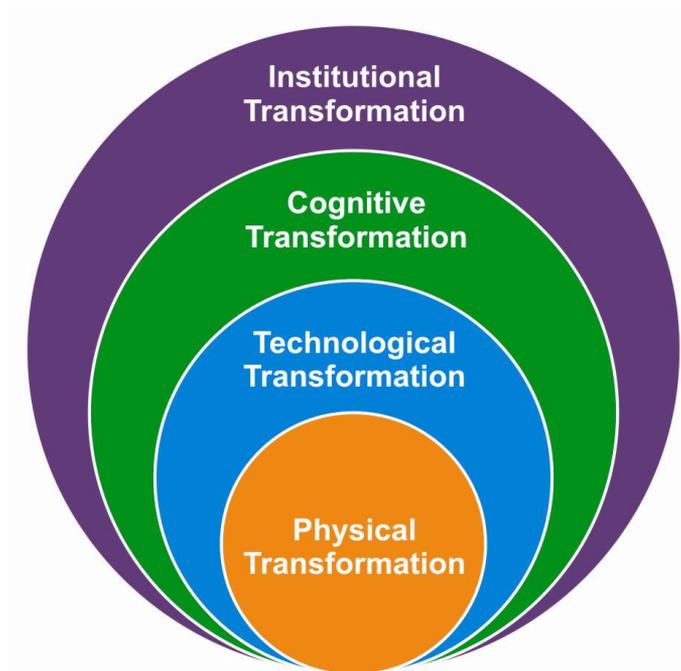


Fig 5: Transformational Model

A transformational model is proposed for virtual education at the Open Schools in India. This model has minimum four inherent transformations:

- Physical infrastructure transformation
- Technology infrastructure transformation
- Cognitive / pedagogic transformation
- Institutional transformation

5.0 NATIONAL CONSULTATIVE WORKSHOP

With the purpose to discuss the concept of Open Schooling in India, a discussion paper the consultant develop a discussion paper that was presented at the National Consultative Workshop on Virtual Open Schooling in India on 16th October 2012 in New Delhi organised jointly by National Institute of Open Schooling (NIOS), Noida and Commonwealth Educational Media Centre for Asia (CEMCA), New Delhi.

5.1 Participants

The workshop was attended by Vice Chancellors of Open Universities, staff and faculty of NIOS, staff and faculty of State Open Schools, faculty from Regional Institute of Education (constituent of National Council for Educational Research and Training) etc. The workshop was inaugurated by Joint Secretary (School Education), Ministry of Human Resources Development, Govt of India.

5.2 Programme

Presentations were made on Open Schooling in India: the RMSA perspective by the Chairman, NIOS; Emerging trends for open schooling by Director, CEMCA and Virtual Open Schooling by the consultant. These presentations were followed by group discussion on the following issues:

- Admission requirements
- Teaching and learning
- Content development
- Assessment and examination
- Administration and quality assurance

One member from each group presented the suggestions/recommendations deliberated therein.

5.3 Suggestions/Recommendations

Presented below a summary of the suggestions / recommendations which have been incorporated by and large in this feasibility report:

Group I:

1. Digital chalk and talk model
2. Content availability through OER
3. Content in modular format supported by audio, video, animation, simulation etc.
4. Support system in the form of facilitators, tutors through online / teleconference / email/ blog etc. for solution of the academic problems faced by learners.
5. Academic delivery through mobile, Tab, DTH, SMS, ETC.
6. Continues assessment after each topic
7. Facility to go level-wise for Higher Order Thinking Skills (HOTS) questions/ evaluation.
8. Feedback after each assessment
9. On Demand Examination in the form of virtual Online Examination with facility to provide result immediately after exam is over.
10. Final assessment by Certifying Agency.
11. Credit of continuous assessment in the final result for certification.
12. Single window help desk able to provide following services:-
 - (i) Registration of candidates
 - (ii) Capturing of biometric identification
 - (iii) Capturing of photograph of the candidate
 - (iv) Payment of online fee for registration, examination, duplicate documents etc.
 - (v) Information to candidate about confirmation of admission by Open School
 - (vi) Issue of Identity Card with photo and biometric identification to registered candidates
 - (vii) Maintenance of email account of their registered candidates

- (viii) Information about dispatch of study material
- (ix) Organising PCP, Tutorials, TMA, Practical facilities with the help of neighboring schools
- (x) Conduct of practical examinations, On Line Examination, Continues assessment etc.
- (xi) Feedback on all issues
- (xii) Facility of grievance redressal

Group II:

1. Content should be in the form of audio/video, multimedia and animation
2. Content should be converted in Open Educational Resources platform so that inputs on the lessons can be enriched by anyone at anytime
3. Facilitators may be available online for particular time, so that students can have an interaction with facilitator by online or offline
4. Continuous evaluation and assessment may be added in the assessment part.
5. On-demand examination and on-line examination may also be recommended for Virtual Open Schooling.
6. Objective and subjective type questions may be included to evaluate student performance.
7. Common service centre may be provided for registration, biometric process, for taking photographs of the student, collecting fees, etc.
8. Feedback should be taken from students from time to time
9. Trained and competent tutors may be engaged for Virtual Open School
10. Online interactions between learners and tutors should be facilitated
11. The courses may also be in regional languages to get more enrolment.
12. Learning material in the form of OER will help learners and institution.
13. Face to face practical examination can also be included.
14. Virtual open schooling system should be monitored frequently.
15. Content should be user-friendly.
16. Multimedia based content in the form of telecast, broadcast and interactive.
17. Content of the course should be same across all over India.
18. Credit accumulation and credit transfer facilities may be given to learners.

GROUP III:

1. Training to Cyber Cafe operators and experts for on line admissions.
2. Very Simple Content in modular approach, supported by audio, video and animation.
3. Translation & Transformation of Content in Regional Languages and not simply by dubbing of learning material
4. On Line Support system through online, teleconferences, emails, blogs etc. for solution of the academic problems faced by learners.
5. On Demand Academic Content through mobile, Television and Tabs etc as movie on demand and song on demand without payment by learner.
6. More stress on Objective Type Question Papers with specific Time Limit.
7. Continuous assessment through On Line System
8. On Line Feedback after each assessment
9. On Demand Examination in the form of virtual Online Examination with facility to provide result immediately after exam is over.
10. Final assessment by Certifying Agency i.e. NIOS/SOS.
11. Credit of continuous assessment in the final result for certification.
12. Single window help desk.

6.0 SURVEY ON READINESS FOR ICT AMONG THE OPEN SCHOOLS

In order to assess the ICT tools and technologies existing in the open schools, the consultant administered a questionnaire survey. This was also taken up with the purpose to examine the readiness of the open schools for ICT. The Questionnaire (Annex-1) consisted of four main sections to elicit information the school and ICT:

- a) Basic information about the open school
- b) Information about the programmes, teachers and students
- c) ICT readiness: availability and quantity of hardware / software
- d) Pedagogic readiness: ICT skills of teachers or competences
- e) Organisational readiness: technological facilities available in the open school
- f) Strategic readiness: strategic plans or performance indicators on use of ICT and improving existing practices using ICT

The survey instrument was shown to ICT and open education experts for suggestions and improvement and to establish the face validity. The instrument was administered during the national consultative workshop held on 16th October 2012 for eliciting responses and for those places from where the participants could not come to attend the workshop it was sent to them.

Only NIOS and three SOS returned the filled in questionnaire, making it extremely difficult to analyse the data and compile any baseline statistics for future reference. It also indirectly revealed a very poor use of ICTs, and readiness for the VOS by the state open schools.

6.1 Survey Findings

The status of use of ICT in State open schools represent a mix picture. Some state open schools are making a good use of ICT while some are yet to implement. Chhattisgarh State Open School (CSOS) was established in 2008. They have institutional presence on the web by having their website and have about 1,30,000 students registered for secondary and senior secondary courses. They develop their own programmes based on the curriculum framed by NIOS. CSOS has the facility of admission form available on their site however admissions are done manually. They conduct their examinations in regular mode (non-online). They have around 10 computer machines, all have internet connection. Their website is dynamic in nature. CSOS uses open source software for database and spreadsheets while for word processing, admission and evaluation they have developed in-house software. CSOS makes use of TV, radio, fax, printers, telephone, scanners and they report about 4 interactive white boards too. Their future plans indicate online admissions and multi-media teaching.

Rajasthan State Open School, Jaipur (RSOS) was established in 2005, having around 80,000 students on its roll. They have adopted secondary and senior secondary courses from NIOS, while a nil report has been sent by them regarding teachers/academic officers. Currently all their operations are manual, no online activity. They have 8 computer systems out of which only one is connected to Internet. RSOS also uses open source software for word processing, database, spreadsheet and presentations. They have, in addition to 8 PCs, one fax, 8 printers, 8 USB drives, one data projector, three telephones and one scanner. There is no technical support and no staff so far has got training in the use of ICT applications handling. They wish to use online technology for admissions, teaching learning, content development, administration and assessment/evaluation in future.

Overall, it can be concluded that State Open Schools lag behind in terms of ICT facilities and use as compared to NIOS where ICT is put to optimum use from admissions till certification.

7.0 VIRTUAL OPEN SCHOOLING

Khan Academy offers video tutorials on different subject, MIT offers free open courseware, Universities are going in for MOOCs offering free course to anyone with internet access, etc. If a student has accessed subject content, contributed content over internet, availed web resources synchronously or asynchronously via internet, we can say the student learned virtually. Virtual learning can be formal (offered by University or college or school) or informal (social media interactions). The web technology via e-learning is changing the formats of delivery mechanisms. Technology has made it possible to shift from print based materials to e-books; from video materials to video streaming on the web; pen and paper examinations to online examination, physical interaction of student-teacher, and student-student to interactive communications in the form of emails, blogs, forums, social networking, video conferencing or online chat etc.

7.1 Defining a Virtual Institution

Wilson (1996) describes the virtual institution as “one which loses much or its entire geographical locus (geographical virtuality) ...and (it) makes the best use of virtual capability.”

Whittington (2000) defines the virtual education institution as anything that delivers higher education to students via the World Wide Web.

For our purpose this feasibility study Virtual Open Schooling is defined as an educational practice that provides opportunity to learners to study a formal school-based course online and gain credit for certification purpose. Learners can study using asynchronously or synchronously technologies. The courses are based on existing Open Educational Resources, and are built around a learning management system with content stored on online repositories and platforms. In order to facilitate the virtual open schooling, the formal structure may follow a consortium approach would be called Virtual Open School and form part of the existing National Consortium of Open Schools (NCOS) at under the NCOS of NIOS. Thus, it is not to be considered as another open school, but a part of the national open schooling system that utilizes the existing structures.

7.2 National Consortium for Open Schooling (NCOS)

The National Consortium for Open Schooling (NCOS) was launched in September, 1997, with a view to facilitate better cooperation, coordination, collaboration and determining standards in Open and Distance Learning (ODL) system at school education level in the country. The Secretariat of NCOS is located in NIOS. The main objectives of the NCOS are

- To promote setting up of State Open Schools (SOSs) in the States by providing professional, technical and academic support services to the State Education Departments.
- To promote advocacy for Open and Distance Learning (ODL) and up-scaling of the Open Schooling Programme in India.
- To facilitate networking and establish collaboration among Open Schools in India by sharing of resources, expertise and experiences in Open and Distance Learning (ODL) at school level.
- To determine standards of the Open and Distance Learning system at school stage to ensure pace setting in programmes and activities of Open Schools.
- To assist the State Open Schools (SOSs) in designing need based specific curriculum and self-instructional material in the regional languages.
- To maintain database of the Open Schooling Programme.
- To promote research in Open Schooling in India.
- To assist in capacity building of personnel working in Open Schools.
- To coordinate with international agencies.

In a nutshell, open schooling (through NIOS and State Open Schools) in India has proved to be an innovative venture to expand the outreach of secondary education to the masses. They offer programmes in

all kind of subjects including practical skills oriented courses. NCOS may look for new models of open schooling and promote the use and integration of information and communication technologies in Open Schools to meet the demands for secondary education comprehensively and cost effectively through a virtual open school. Thus, it is **recommended that the NCOS may also take the responsibility of institutionalizing the practice of VOS in India.**

It is proposed that the VOS would work as a consortium facilitated by NIOS through its NCOS. There shall be a common online platform where all Open Schools would offer their programmes and courses. to the NCOS may decide rules, regulations, policies, practices and procedures etc about functioning of VOS.

The platform operation of VOS may be performed by a Steering Committee as may be nominated by the NCOS. The NCOS nominated steering committee will:

1. Plan, Design, Develop and Deliver suitable Open and Distance eLearning (ODEL) programmes for secondary and senior secondary level
2. Plan, Design, Develop and Deliver suitable Open and Distance eLearning (ODEL) programmes for vocational education sector
3. Facilitate capacity building of staff and teachers (both in terms of quality and quantity) in the area of Open, Distance and eLearning methodologies
4. Support (administratively, academically, financially and technologically) member institutions for successful implementation of VOS activities
5. Conduct periodic review of the VOS activities for quality improvement

There would be a three tier structure of VOS:

- (a) Central Global Node
- (b) Regional Nodes (State Open Schools)
- (c) Participating Access Centres (accredited centers in PPP mode)

Here NCOS will act as the Central node whereas member State Open Schools will be Regional Nodes. Since all nodes will be connected to Internet, a student will be able to access any regional or participating node from anywhere. The Access Centres will be established in Public-Private-Partnership mode and would enable greater access to the facilities of the VOS by the students.

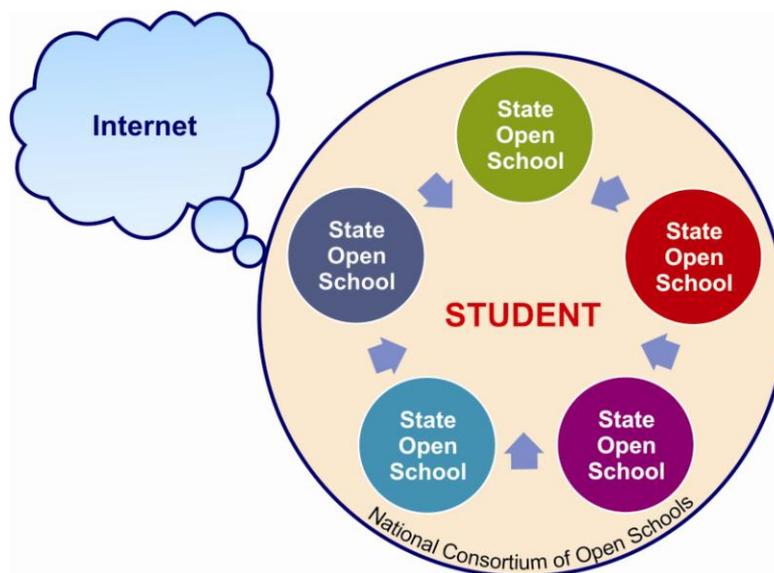


Fig 6: Structural model of VOS

7.3 Objectives of the Virtual Open Schooling

The following are the objectives of the VOS:

1. To develop suitable, need based and career oriented programmes for online offer
2. To create a repository of Open Educational Resources for secondary, senior secondary and vocational courses
3. To build a vocational education community of practice
4. To build capacity in the area of Open, Distance and eLearning methodologies for member institutions
5. To create quality assurance mechanisms for all administrative, academic, financial and technological operations
6. To facilitate students' credit transfer amongst consortium member institutions

7.4. Activities of the Virtual Open Schooling Steering Committee

The VOS Steering Committee will undertake all activities for the VOS platform to impart quality education at secondary, senior secondary and vocational education level with the help of Distance and eLearning methodologies. Therefore, it will carry out the following activities:

1. Identify new and suitable, need based and career oriented programmes
2. Identify new technology mechanisms to increase the scale, access and quality of online teaching and learning
3. Conduct online training programmes for staff and teachers
4. Conduct online orientation programmes for newly registered students
5. Create online repository of course content of its programmes
6. Maintain a repository of OERs
7. Conduct webinars on themes relevant to success of VOS
8. Conduct research on themes relevant to success of VOS
9. Publishing relevant literature in the form of Journal, books, brochure, annual reports etc on activities of VOS
10. Facilitate credit transfer among member institutions
11. Lay down parameters for quality assurance
12. To register students in the courses of their choice via an online admission system
13. To conduct examination and award the Certificates

7.5 Teaching and Learning System

Teaching: Existing teachers of the open schools would be provided training to teach online. Thus we would have two sets of teachers: existing ones and we may have virtual teachers providing their expertise on part-time basis. The system can take the help of large number of voluntary teachers who may be interested to spend time to help students learn online.

Student support: VOS will have a one-stop portal for student services where their queries from admission to certification will be taken care of. Online applications would allow students to check their status of admission or examination through their logins on to the portal.



Fig 7: Teaching Learning System of VOS

The teaching and learning systems should be an integrated one with student support and assessment features inbuilt therein. The students should have access to online database of course details on the server. The student would select the course of choice and pay the fee (NIOS to decide if to make it free as in case of Utah Open High School). The student can have a perusal of detailed course outline to make an assessment of which course would be suitable. The course offering would be a LMS based (say Moodle) with additional linking to Wiki or video server to have access to OERs or video tutorials. Instructions would be synchronous (via audio or video chat) or asynchronous (via emails or discussion forums or RSS feeds). The student would be provided practice test to enable him or her to assess performance, which would be examined by the teacher. The feedback would be written or electronic where the comments are emailed to the learner's id. Examination shall be done by the certifying body. The students may be charged nominal examination fee.

7.6 VOS Technologies (VOS-Tech)

It is proposed that the technologies of VOS-Tech should follow the open source path to reduce the operation cost, and also build institutional capacities to run high-end technology systems without dependence on external support. **Considering the low ICT application and ICT readiness at State Open Schools, it may be a better option to develop the VOS platform initially keeping in view the needs of NIOS, and keep engaged with the SOSs to develop their ICT capacities and encourage them to embrace the VOS.**

Virtual Open Schooling Platform

Online Registration/ Admission System	Wiki-based Open Courses with integrated audio and video
Web Conferencing System (openmeeting or BigBlueButton)	
Online Examination System (in second phase)	Open Source Learning Management System (Moodle or Canvas)

Figure 8: Virtual Open Schooling Platform

(a) **Online Registration/ Admission System:** The NIOS already has a robust online admission system, and the entire admission of the students is now online. This is a clear indication that students have access to online technologies, and it would be worthwhile to consider teaching and learning online. While integrating the new VOS into the existing system would be ideal, it may interfere in the existing operation practices, and would create disturbances in smooth operation. **Therefore, it is proposed that a separate admission/registration module may be developed for VOS. However, all the data captured in the current online admission system should be covered to maintain data integrity and merging of the data with the NIOS system.**

The application software for the admissions has been developed in-house by the developers at NIOS and it is working fine. To avoid duplication of efforts and resources, the same application be integrated into the platform of VOS.

The decision about a payment gateway would depend upon if the courses would be free of cost or students are to pay for enrolment. The application would have interfaces for student to fill up details for enrolment and an administrative interface for verification of details and finalisation of admission. Student can select any node for admission and study. The choice of courses may also be flexible to allow students to choose course from any of the open schools. **Thus, the platform should allow course base registration to the students. Ideally, registrations should be open (without fees), and fees are collected only for examination and support services. Thus, the payment details may be made optional in the registration process.**

Methods of payment of registration fee:

The students would have three ways to pay the course fee, and the procedures for each of these are as below:

- Payment gateway with a Nationalised Bank
- Pay with a credit card / debit card
- Pay with a Demand Draft by mailing it Admission Division at VOSC

(b) **Instructional Delivery:** It is suggested that the system be integrated via an open source LMS platform.

Learning Management System (LMS)

Wikipedia defines a learning management system (LMS) as: “A software application for the administration, documentation, tracking, and reporting of training programs, classroom and online events, e-learning programs, and training content.” A learning management system is a platform for teachers to deliver online course or for students to access online content. It has its implications for traditional courses as well which are taught in face-to-face settings where a teacher can make available learning material as content repository, hyperlinks to resources and managing grades. However, for a virtual institution a LMS can act as a complete package, offering services starting from student registration, synchronous and asynchronous interactions, discussion forums, content storehouse, video lectures, variety of assignments, and learner analytics. There are various LMS available in the market today, both Open Source or low cost and proprietary.

Examples of open source learning management systems are:

- Canvas (<http://www.instructure.com/>)
- ATutor (<http://atutor.ca/>)
- Moodle (<http://moodle.org/>)
- Claroline (<http://www.claroline.net/>)

- Dokeos (<http://www.dokeos.com/>)
- TCExam (<http://www.tcexam.org/>)
- ILIAS (<http://www.ilias.de/docu/>)
- OLAT (<http://www.olat.org/website/en/html/index.html>)
- Sakai Project (<http://sakaiproject.org/>)
- EFront (<http://www.efrontlearning.net/>)

For our purpose at VOSC, it is recommended to use Moodle or Canvas along with a web conference system such as **Google Open Meeting** or **BigBlueButton**. While the LMS will provide a closed option to the paid learners who would actually undergo examination and certification process to receive guided instructions and support, the registration will allow learners to access the course content on a wiki platform. **Thus the instructional delivery system will be based on open Courses on Wiki, LMS and Web Conference System.**

The VOS would be using web- or Internet based instructions. The learning would be facilitated through LMS, while the course content would be available through an open platform like the OER platform of NIOS. Each course will have its share of audio video elements integrated into the course materials, and there would be opportunities for video conference with tutors at appropriate time to allow students interact with experts. There will also be sufficient quizzes and tests, including assignments to assist students receive feedback on their learning to know their progress.

(c) Course Development: Since VOS would cater to the large number of students; it is suggested to have Wiki based content as Open Educational Resources. Teachers of all State Open Schools can contribute to the resource pool in addition to identifying and sharing already existing courses available with quality institutions. Existing course of NIOS and other Open Schools can be converted into digital format and made available online through OER platform. Use of Wiki for course development has several advantages, including collaboration, quality assurance, and updating of the learning materials. The learning materials prepared at NIOS is a collaborative activity and requires intervention of many stakeholders. Everyone engaged in the course material preparation – writer, content editor, language editor, format editor, and other course team members – can use the wiki to develop lessons. After the lessons are finalized, the same can also be made available in print or in PDF form. The MediaWiki platform can handle audio and video materials for delivery, and therefore, it would be highly useful to keep the learning materials up-to-date by adding additional materials though audio and video as well. **Considering that NIOS is already using MediaWiki Platform, the same may be used for course development, and delivery.**

(d) Assessment and Evaluation: LMSs have inbuilt features for allowing teachers to have formative and summative assessment. The grades can be easily compiled and results declared. Such online assessment can be easily carried out via selected LMS. Moodle for example has a variety of student assessment activities, some of which can be automatically assessed, while other need teacher interventions. It is recommended that the internal assessment function of the LMS may be used for continuous assessment of the learners. However, final term-end assessment can take the form of proctorial assessment online in an assessment centre. This will also expedite the result declaration process, provided the system follows more of objective type tests. **As the online assessment technology is growing fast, to use complete online examination system may not be recommended. A proctorial assessment system may be tried, in Phase2 after the teaching and learning system is well accepted by the student community.**

7.7 Operational Issues

Decisions need to be made regarding role of respective open schools. Transfer of student from one place to another and availing services at other place would be taken care of the Consortium. Agreement need to be worked out on credit transfer for courses among open schools. Also to facilitate students to use the system,

there is a need to create Accredited Access Points (AAPs) all over the country. This can be done in a PPP model.

7.7.1 Students' orientation to learn online

The students joining VOS will be able to access the following:

- View lessons, resources, assignments, quizzes and marks
- Access live / interactive sessions
- Access Digital library
- Engage in learning activities
- Communicate and interact with teachers and classmates
- Plan by managing Calendar of activities
- Ask for academic and technical support when needed

While all these services will be available online, the students getting registered for VOS may not be familiar with online learning. Hence there need to be suitable orientation programme mechanisms for students to make them understand that online learning requires self-directed approach for success. It is recommended that every student registered at the VOS platform be asked to go through an orientation course that should inform the roles and responsibilities of the student and how to optimize learning from the VOS.

7.8 Funding Mechanisms

The funding of VOS may be determined in performance agreements as decided by the central and state governments and NIOS/SOSs. There can be different models for funding:

- (d) The programmes can be subsidized by NIOS. The student pays nothing or a minimal amount at the time of registration. The course material would be provided to student free of cost. Student pays only at the time of taking up tests for certification.
- (e) Each Member Open School contributes. There can be a common pool of funding where each open school provide subvention for managing the operations of the virtual open schooling operations.
- (f) Fee sharing: Students are charged programme fee and that fee is shared among the members.

7.9 Cost of Operation of VOS

Tentatively looking the costs associated with establishing a virtual open institution may appear same as that for a traditional school, however there are differences in the budget heads and patterns. During the initiation phase there will be major proportion of expenses on programme infrastructure and technology infrastructure. Let's see different heads where the budgetary provisions needs to be planned:

1. **Personnel:** salaries of staff and teachers will be a major contributor to the expenses. Unlike traditional schooling, in VOS we can have a combination of full time, part-time and teachers on project mode for some special assignments. Recently working from home is also an option, where the expenses would include internet time. Adequate training of the existing staff can reduce the need for additional staff for this purpose. However, for tutoring, teachers may be engaged on hourly basis and this can be recovered from student fees, if required.

- 2. Instruction:** costs would depend on if we build our courses or buy them. Since NIOS has already developed courses and there are academic officers to develop programmes and courses so up-front costs can be different. In addition to Buy or Build courses, there are other items which add to costing:

(a) books and reference materials (paper based or online)

(b) Software: depends on if buying or using open source

(c) other resources: like science kits or art-kits etc

This is no additional cost for NIOS, but the existing courses need to be transformed into open courses for the wiki platform, and that will require significant investment. Though, actual cost per course transformation have not been worked out, it would depend on what other resources are added to the print-based courses.

- 3. Technology:** Here we need to consider the cost on computers, printers, servers, scanners, UPS, antivirus, internet access, LMS costs, video conferencing, cell phone call charges reimbursements etc. Maintenance is very important for the upkeep of machines. Whether the maintenance will be outsourced or be done in-house? The development of the platform will also be a significant cost. While the solutions proposed are based on Open Source technologies, their integration to make a workable system would need substantial investment. While it is understood that the Commonwealth Educational Media Centre for Asia (CEMCA) has plans to develop the system for NIOS, it is extremely important for NIOS to understand the implications for the recurring expenditure of maintaining the system, as well as the cost of tutoring support.
- 4. Training for Professional Development of teachers and staff:** Due to changing technology, staff members need to be trained in latest technology. CEMCA may like to orient staff of NIOS and SOSs on an on-going basis to promote and strengthen the VOS. However, it is understood that NIOS takes the leading role in such activities and CEMCA's role is only catalytic.
- 5. Quality Assurance:** whether in-house competence is available or there shall be external quality audit? This should be the role of the NCOS, as indicated before, and should not be considered an additional expenditure as such.
- 6. Reporting and data analytics tools:** these are used as support mechanisms which are integrated into the administrative systems.
- 7. Marketing or promotional expenses:** to attract enough clients for programmes
- 8. Other expenses:** like legal, health, human resources and travel expenses

8. RECOMMENDED PLAN OF ACTION

Based on the feasibility study, the following action plan is recommended for consideration of CEMCA, NIOS and SOSs:

For CEMCA:

- Engage in orientation of the staff (academic and technical) of NIOS and SOSs to develop skills on using online tools that may be used in VOS
- Consider engaging a technical expert team to develop a platform that would integrate all the existing technological practices at NIOS and offer the same to be adopted by NIOS for Virtual Open Schooling.

- Assist NIOS and SOSs to develop courses for offer on the VOS platform. This can be done by transformation of the existing courses.
- Engage through NCOS of NIOS to develop consensus and understanding about credit transfer and certification.

For NIOS:

- Upgrade the network and computer facilities at the HQ and the Regional Centres
- Continuously train the staff to adopt ICTs, and deploy additional human resources that may be needed to support the platform.
- Transform the existing courses to wiki-based open courses for adoption in the VOS platform.
- Create a system for VOS contact centres all over the country to provide access to students. This can be done under PPP model without investment by NIOS.
- Offer pilot courses on the platform, as soon as it is ready, and then deploy the system for all courses.
- Promote the VOS through nationwide campaign for creating awareness

For SOSs:

- Participate in the VOS platform actively.
- Improve their ICT infrastructure, and develop courses for the platform.
- Develop consensus with NIOS on credit transfer and certification.

Suggested Timeline:

- Orientation Workshop on Virtual Open Schooling: Feb-Mar 2013
- Initiating discussions on the integration of the platform: April 2013
- Contracting a developer agency for the platform development: July 2013
- Content development for a course: July-Dec 2013
- Testing of the Platform: Nov-Dec 2013
- Launch of the VOS platform: January 2014.
- Orientation Workshop on Virtual Open Schooling: Jan-Feb 2014
- Discussions on Credit transfer: April 2014
- Additional Course Development: July 2014
- Full running of the system: Jan 2015.

9. CONCLUSIONS

Establishing virtual open schooling practice in the NIOS system would support its goals of reaching increased number of students. Considering that students are now taking admission online, it may be presumed that the students have access at some place, and therefore, initiating VOS is an appreciative effort. Both CEMCA and NIOS having inked a Memorandum of Understanding on the matter have shown great commitment to start a new phase of student engagement at the secondary and senior secondary education level through open schooling. It has been observed that NIOS has shown certain level of maturity in terms of ICT application for administrative purposes, and have initiated work on Open Educational Resources. Therefore, Virtual Open Schooling is a right step towards providing improved quality of educational delivery. The simple model suggested in this feasibility report encourages a system based on openness to help the learners study at their personal time, pace and space, and receive certification.

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Questionnaire: ICT Readiness at Open Schools

Status of Information and Communication Technologies (ICTs) in Open Schools



National Institute of Open Schooling (NIOS), Noida, U.P.
&
Commonwealth Educational Media Centre for Asia,
(CEMCA), New Delhi



Dear Colleague,

The purpose of this questionnaire is to collect information on the present status of use of ICT in Open Schools. The questions pertain to kinds of technology available and used, courses and programmes already on offer online and the readiness of teachers and administrators for online education. Kindly provide correct information. This is to assure you that the data obtained will be used for NIOS and CEMCA purposes only.

Your responses will remain completely anonymous and your name will not be given to any external parties, all information will only be used for aggregate research purposes. Thanking you for your kind cooperation.

(A) Basic Information About the School

1. Name of Open School _____
2. Year of Establishment _____
3. Institution Web Site URL _____
4. Name, position and email id of person completing this form

(B) Information About the Programmes, Teachers & Students

5. Main programmes and levels: please specify full-time, part-time and distance programmes

Level	Type	Number of programmes		
		Full time	Part time	Distance / Online mode
Secondary	Compulsory			
Secondary	Optional			
Senior Secondary	Compulsory			
Senior Secondary	Optional			

6. Number of teachers

	Full time	Part time	Distance / Online mode
Secondary			
Senior Secondary			

7. Number of students

	Full time	Part time	Distance / Online mode	Evening class students
Secondary				
Senior Secondary				

8. Do you develop your own curriculum and programmes of study?	YES
	NO

If yes, please specify for which programmes

(C) ICT Readiness

9. Number of computers on campus: _____

10. How many computers are permanently connected to the internet: _____

11. How many data projectors are available to teachers? _____

12. Do you have good printing facilities? YES / NO

13. Do you have broadband internet access? YES / NO

If yes, please give Bandwidth and name of Internet Service Provider

14. Is there a wireless network? YES / NO

15. Do you have IT technical support? YES / NO

16. If answer to Q. 15 is yes, is the technical support adequate? YES / NO

(D) Pedagogic Readiness

17. Do all your teaching staff have basic IT skills? YES / NO

18. Have any of your staff been trained in open and distance learning? Please give numbers and Place of training and dates.

19. Have any of your staff been trained in elearning? Please give numbers and place of training and dates.

20. What use is currently made of ICT in teaching & learning on campus?

(E) Organisational Readiness

21. Have any institutional administrator been trained in distance or elearning? YES / NO

22. Do you have a scheme to support teachers' purchase of personal computers or laptops? YES / NO
If yes, pl mention about it in one or two sentences

23. Does your open school offer programmes outside your jurisdiction state? YES / NO

24. Does your library have online access to books, journals or periodicals? YES / NO

25. If currently there are no open and distance learning courses at your Open School, do you have plans to develop them? YES / NO

If yes, so what might they be?

26. Where will the new learning materials come from?

27. What are your three main resource challenges for considering open, distance or flexible learning approaches?

(F) Strategic Readiness

28. Does your Open School's strategic plan include objectives to improve learning and teaching approaches? YES / NO

If yes, what are the performance indicators?

29. Does your strategic plan include objectives to develop elearning? YES / NO

If yes, what are the performance indicators?

30. Does your strategic plan include objectives to increase programme delivery options by more flexible delivery. If so, what are the performance indicators?

31. Which of the following policies are in place? Pl tick all that apply:

- Internet/Network Acceptable Use
- Information Technology
- Plagiarism or Academic Deceit
- Recognition of Prior Learning
- Quality
- Distance Learning

32. What is the IT allocated budgets for your Open School for this financial year?

33. How many IT trained staff (in numbers) are there in the Open School under the following categories?

Category	Number of trained IT staff (In-House)	Number of trained IT Staff (Outsourced)
○ Only Basic Computer <i>Email/ Word Users</i>		
○ Advanced Computer Software Users		
○ IT Project Managers		
○ Database Administrators		
○ Software/ Application Developers		
○ Network Administrators		
○ Helpdesk/ Desktop Management		
○ Website Management		

34. WHAT are existing roadblocks in implementing ICT initiatives?

(Example –

-Internal Roadblocks - Lack of adequate manpower, State Policies/ Acts, Inter-departmental dependencies, Monitoring of schemes, Corruption, Accounting, Budgetary Allocation, etc;

-External Roadblocks - Funds/ Grants, GOI Policies/ Acts, Infrastructure, Delivery channels, Demand/ Supply mismatch, Relationships with other Schools, Role of NIOS, and PPP models etc.)

- **Internal to the Open School –**

- **External to the Open School –**

35. Is there any further information you would like to provide to help us to evaluate your ICT readiness? Attach additional sheet if required.

36. For the following areas, pl indicate the practice and the kind of technology being used currently, in addition to how you wish to improve the existing practice (future plans):

Area	Current practice (how you are doing it)	Technology used for the current practice	Future plans for adopting any new technology	Any inputs not covered in previous columns
Admissions				
Teaching and Learning				
Content Development				
Assessment and examination				
Administration				
Quality Assurance				

Virtual Open Schooling in India