INDIAN JOURNAL OF EDUCATIONAL TECHNOLOGY

Central Institute of Educational Technology
National Council of Educational Research & Training

About the Journal

CIET, NCERT has been a premier institution for development and dissemination of resources and techniques related to Educational Technology (ET) for better understanding of teaching-learning at school level. With renewed thrust on educational technology using digital platforms, need for a quality journal on educational technology in India is felt more than ever. Keeping this in regard, Indian Journal of Educational Technology will be a medium for scholarly presentation and exchange of information between researchers, professionals, and practitioners of technology related field of education. The journal aims at covering disciplinary areas of educational technology (ET) for school education and teachers' education. The specific objectives of this journal are: i) to provide an open access journal for sharing updated and peer reviewed research on Educational Technology for easy access and ii) to promote research on the integration of technology in school and teacher education, promote innovative practice, and inform policy debates on educational technology. This bi-annual open access online peer reviewed journal will be a platform for exchange of ideas and would also become a basis for further innovation in ET in school and teachers' education.

Notes to Contributors

Indian Journal of Educational Technology is a journal especially designed for scholarly discourse of use of various forms of technology in education. Some of the themes encompassed under its broad purview of area are: Education Technology (ET), Information and Communication Technology (ICT) in education, Distance education and technology, Technological integration into pedagogy and content, Open Educational Repositories (OER) and FOSS, Innovation in educational system, Computer-based learning, Audio-video and multimedia in education and issues thereof, Technology cognition and curriculum, Impact of technology in education, Nature of technology and learning, Mobile learning, Learning through social media, Technology assisted evaluation systems, Technology support for differently abled population, Flipped classroom, Virtual and Augmented Reality, Artificial Intelligence, robotics and education, Impact of technology on learning, Social media and children, Economics of technology and its impact on education system, Educational planning administration and technology and Online courses for school and teacher education. We look forward for your contributions in the coming issues. Your feedback and suggestions are also welcome on the following address:

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Editorial Team

Contents

Editorial

The United Nations Education, Social and Cultural Organisation (UNESCO) broadly regards technology as the knowledge, skills and creative processes that may assist people to utilise tools, resources and systems to solve problems and to enhance control over the natural and made environment in an endeavour to improve the human condition (UNESCO, 1985). Under this broad sense of technology, educational technology would imply not only artefacts and devices but also methods of organisation and systems of teaching, which are employed in education to improve the learning environment (Anthony, 2012). From the use of blackboards and slates to the use of smart boards and tabs in the modern classrooms or use of a range of pedagogies from behaviourist to constructivist, technology has had a seminal influence on the teaching and learning processes in our country. With the advent of digital technology, the pace and sweep of technological influences have impacted the learning of students fundamentally. So, it is important to understand the linkages that technology has with modern education. Students are no longer solely dependent upon schools and universities for learning. Technology has provided them opportunities to learn as per their own styles and pace. Has the relationship between the learners and teachers changed? If yes, in what ways? Will the new technology also bring in a new pedagogy? Does it ask for a new learning theory replacing all the earlier ones? Are technology, learning and cognition intertwined? If yes, in what ways? In what way technology is improving the quality of education? Does technology necessarily bring equity in education? Has the emerging technology been helpful for the purposes of inclusive education? The context of libraries in schools and universities has also changed. Students and teachers/faculty members no longer visit libraries for physically accessing books and journals. Locations of schools, colleges and universities are becoming irrelevant. Is it so? What will be its impacts? In a country like us while digital divide exists, the access of digital technology to a few in the society further accentuates the class-divide within the education system. How far are such changes desirable? Does technology liberate students and teachers or enslave them? It is important to come out with evidence-based findings on these and many more such issues and publish them in order to make a more informed debates and discussions among the peers on the matter. Indian Journal of Educational Technology (IJET) seeks to achieve this objective. We are happy to inform that IJET has been included in the UGC-CARE list of approved journals.

Given the importance of technology in education, the draft National Education Policy (NEP) 2019 (Draft NEP, 2019) too has emphasised its myriad roles in the Indian educational systems. As it is known that the Committee for Draft National Education Policy submitted its report on May, 2019. Ministry of Human Resource Development (MHRD), Government of India (GoI) had constituted this committee under the chairmanship of Dr. K. Kasturirangan in June, 2017. Prior to this, MHRD led a massive exercise in the country at every possible level of the society seeking inputs all stakeholders

on the policy. A 'Committee for Evolution of the New Education Policy' under the Chairmanship of Late TSR Subramanian, former Cabinet Secretary, collated the feedbacks and inputs from the stakeholders and submitted its report in May, 2016. The present draft National Education Policy (NEP) 2019 is a voluminous document having 23 chapters and 477 pages. It is divided into four main parts, viz., Part I-School Education, Part II-Higher Education, Part III-Additional Key Focus Areas and Part IV-Transforming Education. Along with these four parts, there are addendum and appendices. Part I- School Education has eight chapters covering topics such as, Early Childhood Care Education, Foundational Literacy and Numeracy, Reintegrating dropouts and ensuring universal access to education, Curriculum and pedagogy in schools, Teachers, Equitable and inclusive education, Efficient resourcing and effective governance through school complexes and Regulation and accreditation of school education. Part II- Higher Education has 10 chapters such as, Quality universities and colleges, Institutional restructuring and consolidation, Towards a more liberal education, Optimal learning environments and support for students, Energised, engaged and capable faculty, National Research Foundation, Teacher education, Professional education, Empowered governance and effective leadership for Higher education institutions and Transforming the regulatory system. Part III- Additional Key Focus Areas has 4 chapters on: Technology in education, Vocational education, Adult education and Promotion of Indian languages. Part IV-Transforming Education has 1 chapter, viz., Rashtriya Shiksha Aayog. Addendum-Making it happen has 2 main topics discussed and they are, Financing and Way forward.

The draft policy seeks to address the five main challenges, viz., (i) access, (ii) equity, (iii) quality, (iv) affordability, and (v) accountability, faced by the current education system. The use of technology in education has been discussed in the context of all these challenges. In the part on school education, the policy sees technology mainly as a tool to enhance access, bring equity, affordability and accountability in the different educational settings. So, in the chapter on Foundational Literacy and Numeracy, it talks of National Teacher's Portal (DIKSHA) having a special section on high quality resources on foundational literacy and numeracy. It further proposes computer-based adaptive assessment to be implemented across all secondary schools in the country initially and then to all schools once computers and tablets are made available in all schools by 2023. Technological interventions as aids will be made available to teachers especially in regional languages that "teach literacy, numeracy and other foundational and curriculum material and carry out adaptive assessments and other personalised learning'. It also avers that technological interventions will never be viewed as substitutes for teachers. In the 3rd chapter on universal access to education, the policy envisages creating database of all dropouts and out of school children and putting local community in charge to help such children and ensure that they eventually return to school. For CWSN (Children with Special Needs), the policy seeks to utilise innovative educational platforms involving technology for creating and sharing e-resources, promotion of e-learning and introduction of assessment on demand. In the 4th chapter on curriculum and pedagogy in schools,the draft policy suggests incorporating "computational thinking and digital literacy" along with local and Indian traditions, ethical reasoning, scientific temper etc. in curriculum.In the same chapter, the draft NEP advocates for "learning science bilingually" from grades VIII and to talk about it to in the

"local news channels". Albeit in a limited sense, it does seek to utilise mass media for communications in education. Further, it says that the "new curriculum will integrate digital literacy for all learners at the basic level, with hands-on assessments and worksheets keeping in mind the available digital infrastructure and at a more advanced level, curricula will be developed for computational thinking and programming and other computer-based activities" including textbooks on computer sciences. The draft NEP seeks to use digital technology for assessments with far-reaching consequences. It says, "Once internet and computers are standard in schools, assessment at all levels-especially during the Middle and Secondary stages –may also be conducted in an adaptive computer assisted manner, so that students could regularly monitor their own progress and formulate, with the help of their teachers, revised personalised learning plans and goals. Formal official assessments, such as Board and entrance examinations, could eventually be conducted in this manner also, with students thereby easily able to take such tests on more than one or two occasions to improve". It also recommends extensive use of computer-based testing by the National Testing Agency (NTA). The policy also seeks to make internet based apps, assessments and online communities available for students. All textbooks will be made available in digital formats including for CWSN as well.

In the chapter on teachers, the draft NEP suggests creating a conducive environment and culture for teachers at school and along with the facilities of clean drinking water, toilets, electricity, computing devices and internet would also be made available in all schools for all teachers. Flexible, modular and online platforms for teachers will be created not only for their continuous professional development but also for sharing resources and ideas, the policy envisages. It further recommends strengthening all B.Ed. programs with training on recent advances in pedagogy, evaluation and educational technology. It proposes to utilise IT based technology for recruitment, promotion and transfer of teachers for bringing transparency in the system. In the chapter on school complexes, which is to combine a few nearby schools for better sharing of resources, not only technology will be used to share the resources in an effective manner but, the technology itself will be shared in a manner which is useful to all sections of the school complexes. In the chapter on governance and accreditation, the draft policy wishes to utilise technology for a more transparent system in place for admissions into schools (both government and private) to ensure fair entry for disadvantaged students in schools. It also foresees extensive use of technology in creating norms for accreditation and maintaining such a record in the public interests. The draft NEP-2019 might have suggested a more in-depth deployment of technology for the purposes of inclusive education and CWSN children.

As mentioned earlier the part II of the draft NEP-2019 deals with the Higher education. Technology has not been mentioned as explicitly in this part of the draft policy as has been mentioned in part I, dealing with the school education. However, it is obvious that there are several initiatives that the draft policy talks about are not possible without the use of technology. One of the areas in which the role of technology has been clearly delineated in the draft NEP is Open and Distance Learning (ODL). It talks about using technology to enhance the access and quality of ODL.In this regard, it further proposes to strengthen Massive Open and Online Courses (MOOCs) by enhancing its outreach

overseas as well and by ensuring quality courses on MOOCs. "Study in India" portal will be created to attract overseas students to come to India and study. To avoid duplication of efforts, all types of resources created for ODL/MOOCs will be shared through "online digital repositories". In the context of accessing journals in libraries, the draft NEP avers that "the Government of India (GoI) will set up a mechanism, e.g., becoming a single buyer, for online access to journals for all public institutions in the country, so as to save on cost and improve access". The draft NEP advises to provide best facilities such as computers, internet and institutional emails besides other things to faulty members. The draft NEP has recommended setting up of National Research Foundation (NRF) to boost the research in higher education institutions. The draft policy visualises four divisions in NRF presently. One such division will be on Technology while other divisions will be related to Science, Social Sciences and Arts and Humanities. It also advises Department of Education of the State Governments to focus on online education also for both pre-service and in-service programs. Use of ICT in teaching is also one of the suggested areas for faculty improvement programs in higher education. The draft policy also has a section each on legal education, healthcare education and technical education.

The nineteenth chapter, in the IIIrd part of the draft policy document, deals with the technology in education exclusively, cutting across all levels of education. It begins with establishing objectives of integrating technology in education appropriately, viz., i) to support teacher preparation, and development; ii) improve teaching, learning and evaluation processes, iii) enhance educational access to disadvantaged groups and iv) streamline educational planning, administration and management. Although draft policy has talked about bridging digital divide at several places in the document, it perhaps requires special mention in the chapter on technology in education. The draft policy identifies a few important concerns related to technology integration in education in the country. One such concern is the availability of the local expertise in resolving and maintaining hardware and software at remote locations.The draft also exhorts institutions to seek software solutions for issues plaguing institutions or systems and for that, it has also suggested a model to be adopted. Its suggestions range from identifying stakeholders to creating technological solutions to doing pilot study with these technological solutions and then scaling them up. The draft also calls for increasing usage of Free and Open Source Software (FOSS). It recommends setting up of a new autonomous National Educational Technology Forum (NETF) which will provide a platform for the "free exchange of ideas" to attain the above-mentioned objectives. It also lists approaches for integration of technology. Teachers' opinion will be the key while integrating technology in education. The draft policy also recommends establishment of Centres of Excellence in Educational Technology at prominent universities. It has also suggested three-point guidelines for technology interventions. They are i) hardware-cloud-based commercial infrastructure, ii) software- FOSS will be preferred, iii) data- all public data will be owned by the government. Then the draft policy recommends extensive use of technology for teacher preparation and their professional development, in improving teaching, learning and evaluation, in enhancing educational access, and in streamlining educational planning and management. At the end of this chapter, it has also talked about disruptive technologies or innovations, which seek to alter the technological operations

significantly and replaces old markets with the new ones. In this regard, use of Artificial Intelligence (AI) or Virtual Reality (VR) or Blockchain in education has been talked about.

Chapter on Vocational Education visualises data gathering, MIS and technology support for rollout of vocational education. It also talks about offering certificate courses on the theoretical aspects of vocational courses through online. In the chapter on adult education, the draft policy emphasises on integrating digital literacy in the mainframe of adult education objectives and use internet - based online platforms as well, to achieve the objectives of adult education.

We would like IJET to act as a catalyst for generating debates and discussions on the draft National Education Policy, 2019 in the coming months. It is a pleasure to bring out the second issue of the journal which consists of a variety of sections having research, review and general articles. We hope that the enthusiasm of the fraternity for academic discussion will help us in bringing out the subsequent issues with more number of articles. We extend our appreciation to the authors for sending their works and the reviewers for reviewing those works by taking out time for such academic works. Most importantly, we would also like to thank the small editorial team of ours who have worked consistently for bringing out the current issue.

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Research Article

Capacity Building of Teacher Educators for e-Learning Tools: An Experimental Study

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Abstract

The integration of technology in our education system has generated a necessity to place digital practices among teacher educators, who need to use computers more than anybody else as they help in shaping the future teachers. An experiment to study the effect of training on knowledge and acquisition of skills to use e-Learning Tools among teacher educators was conducted. The treatment was designed in form of a training programme. The Analysis, Design, Develop, Implement and Evaluation (ADDIE) model was designed. The results indicated the positive affect of training on the knowledge acquisition and on the skills to use e-learning tools by teacher educators.

Keywords: Teacher Education, Teacher Educators, e-Learning Tools, ICT, ADDIE

Introduction

E-learning uses the various technological tools to reach and give information via internet for the learning process. These tools can make teaching and learning more efficient and productive by enhancing and facilitating the teachers and learners both. This can make the students more creative and independent if the teacher is not present in the classroom. There is wide range of e-learning tools which provide learner the opportunity to create their own digital environment and learn as per need. e-learning is designed for variety of learners and has given range of tools including e-mail, blogs, wikis, podcasts, screen casts, and video streaming etc. which makes the e-learning system more effective.

Government of India (GoI) is increasing awareness about e-learning in tertiary institutions. This has been taken place as blended approaches before going into complete e-learning mode. Blended e-learning involves a combination of the conventional face-to-face and online technology-based learning (Wang, 2010). According to Singh (2003) as cited in Yushu (2006), "*blended e-learning mixes various event-based activities, including face-to-face classroom, live e-learning and self-paced learning. Teachers, being a part of this system, have to embrace technology, so that they can create skilled professionals for our digitized nation*" (Umoh and Akpan (2014)).

According to UNESCO (2010), "*the training of teachers should remain a central focus for maintaining the quality though it is facing a challenge across the world. UNESCO facilitates initiatives related to the integration of ICT in teacher education by supporting existing teacher development communities of practice, multi-stakeholder partnerships, capacity*

building of policy-makers and the development of international standards on ICT competencies for teachers."

NCTE (2014) has come up with new curriculum frameworks, which have modified the complete structure of Teacher Education in terms of duration, curriculum, introduction of new courses, etc. ICT has been included as a compulsory part of curriculum for the first time. As per Teacher Education Planning Handbook (2015-2016) "*Technology in Teacher Education is to be actively integrated in all TE institutions. Satellite transmission communication, content development, MIS, interactive and self-paced learning should be the focus areas for bridging the divide digitally.*"

Under the scheme of Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT)various schools of education in the country has set up centres which are working in professional development of teachers. This has provided opportunity to teacher educators to get training at national level and enhance their competencies (PIB on Status of National Mission on Teachers Training (2018).

Need and Importance of study

Though many studies have reflected that the experiments and projects are beneficial for students and teachers but the studies on teacher educators are still negligible which has made the researcher to focus on this. Different ways of experimentation including developing multimedia packages (Khirwadkar, 2008), open source tools for mathematics (Joshi and Pandey, 2012), intel@teach essentials course for teachers (Light, 2009), teachers training through ODL by using MOODLE (Kannan and Narayanan, 2010), E-content for physics (Gershom and Mohanasundaram, 2008) and ICT training module (Gulhane, 2011) have been done to study the impact on teachers as well as on students. Potchelve (2010) studied on various instructional approaches for instruction through ICT and Senapaty (2012) used TPACK model for integration of technology which may be included in education system to improve learning. Smith and Greene (2013) conducted an e-learning programme during teaching practice of pre-service teachers and showed that it was helpful and successful. Martin et al. (2013) also developed a multimedia instructional module based on the ADDIE model which seemed to be effective on the learners. The studies show that the knowledge, attitude, skills were affected and they were ready to adopt technology for their professional growth. So, the need of conducting an experiment for teacher educators is preferred by the researcher.

Operational Definition of Key Terms

- e-Learning Tools –These are associated with e-learning for managing and handling synchronous and asynchronous forms of electronic communication.' They may be chat, email, blogs, wikis, discussion forums, virtual classroom, testing tool, etc.

- ADDIE Model - The ADDIE model of instructional design is a generic instructional model providing an organized process for developing instructional materials.

- Competency - Competency is referred to 'A measurable pattern of knowledge, skills and other characteristics required to operate various e-learning tools successfully.

Objective of the Study

To study the effect of training on knowledge acquisition and skills to use e-learning tools.

Hypotheses of the Study

H_{01}. There is no significant difference in the scores of teacher educators towards knowledge acquisition in pre and post- test.
H_{02}. There is no significant difference in the scores of teacher educators towards skill acquisition in pre and post- test.

Sample for the Study

Thirty (30) teacher educators from Teacher Education Institutions (TEIs) affiliated to Guru Gobind Singh Indraprastha University (GGSIPU), Delhi. The experiment was conducted in confronted situation at one Teacher Education Institution (TEI) only.

Delimitation of the Study

1. Experimental study was limited to only 30 participants randomly selected from the TEIs and conducted in confronted situation as one TEI only.
2. This study focussed on selected e-learning tools for which training has been provided to teacher educators.

3. Both the hypotheses were statistically tested at 0.05 level only.

Method and Procedure

Before this experiment, at first, a study was conducted to analyse the level of competency of teacher educators towards e-learning tools. Results of the study indicated that the competency for using the e-learning tools among teacher educators was less than average. For this research, single group pre-post- test design was chosen as the method which includes all those participants which were the part of survey. This design has been selected because random assignment of participant into experimental and control group was not possible to make. It is often termed as 'compromise designs' (Kerlinger, 1970), an apt description when applied to such educational research where the random selection or random assignment of schools and classrooms is quite impracticable. The researcher has selected a pre-experimental design i.e. the one group pre-test – post-test, in which data was collected on participants' level of performance before the intervention took place (pre-), and after the intervention took place (post). Researcher has selected a group of teacher educators of various Teacher Education Institutions (TEIs) randomly, from those, who were the part of the survey for the treatment for knowledge acquisition and acquiring skills to use e-learning tools. A three (03) days (daily 9:30 am to 5:30 pm) face to face workshop was organized as the treatment. To study the effect of training in the form of treatment, a self-developed and

validated test was applied on the teacher educators as pre-test and post -test, titled "Test for Knowledge and Skills (TKS)". This test has two parts: Knowledge based Multiple Choice Questions and Skill based on Three (03)-point rating scale.

The researcher has planned the experimental by popular instructional design model i.e. ADDIE MODEL, "ADDIE" stands for Analyze, Design, Develop, Implement and Evaluate.

Procedure

The ADDIE model has been used in this research in the context of organization of a treatment for teacher educators and also for designing the content for the treatment.

Analysis

1. Need Analysis for Training

Before the research, an analysis was done by the researcher to study the need of the training. The competency of teacher educators towards e-learning tools has been studied on four dimensions- Basic Computer Competency, Advanced Computer competency, Basic Internet Competency and Advanced Internet Competency (Gupta & Singh (2018)). The major outcomes indicated that in Basic computer competency 66.09% teacher educators are competent, in Advanced computer competency 42.83% teacher educators are competent, in Basic internet competency 54.97% teacher educators are competent and in advanced internet competency only 18.09% teacher educators are competent. The results showed that teacher educators have very less competency to use e-learning tools. One of the factors was due to lack of training.

These results indicated that the teacher educators need to be oriented and trained about e-learning tools, so that they can become competent and use these tools on regular basis in their teaching and other academic work.

2. Context Analysis

Through survey, the researcher has identified that the teacher educators are negligible competent to use e- learning tools. So, a workshop was planned to see the impact of training on teacher educators for usage of e- learning tools. The institution for the workshop was selected once the permission by the Head of the institution was sought. Only one TEI was selected which is affiliated to Guru Gobind Singh Indraprastha University, Delhi.

3. User Analysis

The training was given to randomly selected teacher educators of various institutions teaching B.Ed. course. It was provided by the results obtained through analysis of the scale developed for advanced internet competency. The training was implemented by the resource persons specialized in ICT and who have earlier experiences and undertaking such workshops in various organizations.

4. Learner Characteristics

There were few characteristics of teacher educators, which were identified through the survey, i.e. Age of teacher educators lies between 25 – 50 years approximately; they have some basic competency of using e- learning tools. They were interested to join the training and to learn the skills of using e- learning tools. It was also been identified that most teacher educators have internet access either on desktop at the office or personal laptops or mobile phones. Almost all the teacher educators were comfortable in English medium which helped in the development of modules in English medium only but it was decided that care will be taken to deliver the instruction bilingual.

5. Analysis of the Content

The researcher then analyzed the different e-learning tools for which treatment has to be provided to the teacher educators. The e-learning tools useful in the area of teacher education were identified and discussed with the experts. With the help of this analysis, the e- learning tools for experiment were selected. The selected e- learning tools were:

1) Various Applications of Google i.e. Gmail, Google doc, Google Form, Google Sheet, Google Groups, Google Drive, Google calendar & Google Hangouts.

2) Creating and editing a Wiki Educator page.

3) Creating a Screen cast and making video tutorials.

4) Conducting Web conferencing/virtual meetings through Skype, Google hangouts and WizIQ.

5) Understanding LMS, Creative Commons Licenses and MOOCs.

Design

1. Design for Training

The workshop was designed on the basis of need analysis. A three days' workshop was planned on the theme 'e-learning Tools for Teacher Educators' in one of the affiliated institution of GGSIP University having the objectives: to orient teacher educators for usage of e- learning tools in their teaching learning process, to help them understand the various e-learning tools which may be used in education, to make them practice the usage of various e-learning tools for communication, pedagogy and collaboration and to enhance their technological skills through e- learning tools. Various sessions of the workshop were designed for three days.

2. Planned Instructional Strategies

• Lecture cum demonstration by the experts for the practice of various e- learning tools.

• Discussion among the participants of the workshop and the experts (mentors) before and after each planned session.

- Discussion through online platform in which a Google group was created for the threaded discussions among participants.

- Self-directed learning in which the participants saw the video tutorials made by the researcher and uploaded on Social Network. Along with this, the video tutorial was e - mailed to the participants for their learning at their own pace.

- Collaborative learning environment created through Google docs for writing their opinions. Some activities were also assigned to participants, for their completion and sharing it with other participants.

3. Planned Delivery Methods

- **Face to face and online mode (Synchronous and Asynchronous)**: Presentations in the workshop through face to face mode by the experts in which they demonstrated the usage of various e-learning tools. Various activities were also planned for the online mode like working on Google groups, Google docs, Gmail, video lectures.

- **Multimedia presentations face to face**: Some presentations along with the demonstrations were given in multimedia form explaining the usage of e-learning tools in education along with the conceptual understanding of e-learning tools.

- **Multimedia presentations shared through online groups**: Multimedia presentations of all the sessions were shared though Google Group and participants were allowed to download them.

- **Screencasts shared on Social Network**: Screencasts of all the tutorials were prepared through screencasting software and were uploaded on Social network, which could be downloaded by the participants for future use also.

- **Discussion groups on Google:** Groups made on Google for the threaded discussions to resolve the query (if any) remained unsolved in the face to face sessions.

- **Modules shared through email**: Modules developed by the researcher were shared through mail and groups for the participants.

Various activities were planned during the sessions to give hands on learning to all the participants.

4. Assessment Strategies

Assessment was done through activities given after the instruction in the experiment. The experts and the researcher assessed the activities done by the participants simultaneously and resolved their problems, if any.

5. Design for Content

Design of the modules was planned according to the aims of the experiment. Modules for the study were developed by the researcher and some modules were taken from the internet,

which were under Creative Commons (CC) License. Modules for the e-learning tools created in the form of .pdf file by using screenshots along with the text and distributed to the participants in form of soft copy. Along with this, the multimedia presentations and screencasts were also ready and shared through various online modes like Gmail, Google+, Google Group, etc.

Development of content

In the development phase, the researcher created and gathered the content of experiment as was suggested by the design phase. Two types of modules (textual and video tutorials) were developed by the researcher and the third type (Multimedia presentations) was developed by the experts, who were invited as resource persons in the workshop. Developed modules were content validated to ensure that the developed modules fulfil the aims of the experiment.

Table 1: Content for the Experiment along with instructional strategy and delivery method

S. No.	e-learning tool	Instructional Strategy	Delivery method
1	Gmail	Lecture cum Demonstration, Self-Directed Learning	Face to face, screencasts, email
2	Google Group	Lecture cum Demonstration, Collaboration, Self-Directed Learning	Face to face, screencasts, email, Discussion Groups
3	Google Calendar	Lecture cum Demonstration, Collaboration, Self-Directed Learning	Face to face, screencasts, email
4	Google Drive, Google doc, Google Sheets, Google forms	Lecture cum Demonstration, Discussion, Collaboration, Self-Directed Learning	Face to face, screencasts, email
6	Open Educational Resources (OER)	Lecture Discussion, Self-Directed Learning, Collaboration	Face to face, email, Multimedia
7	WikiEducator	Lecture cum Demonstration, Discussion, Collaboration, Self-Directed Learning	Face to face, email, Multimedia
8	Virtual meeting-Skype, WiZiQ	Demonstration, Discussion, Self-Directed Learning	Face to face, email
9	Screencasting-Jing	Demonstration, Discussion, Self-Directed Learning	Face to face, email
10	Learning Management System (LMS)	Lecture Discussion, Self-Directed Learning	Face to face, email, Multimedia
11	Massive Open Online Courses (MOOCs)	Lecture cum Demonstration, Discussion, Self-Directed Learning	Face to face, email, Multimedia

Implementation (experimentation)

Experiment was conducted as per the schedule planned for the training programme. During the implementation phase, the experts delivered the content according to the modules and suggested instructional strategies.

Evaluation

Evaluation was also done in two phases i.e. before the treatment and after the treatment. For evaluation purpose a Pre and post- test (Test for Knowledge and Skills) was developed by the researcher. This was based on knowledge and skills for specific e-learning tools for which the training was provided to the participants. A pre-test was administered on the teacher educators (participants of workshop) on the first day of workshop and the same test was administered as Post-test after the training.

Analysis of Data

The collected data was analyzed by applying the statistical technique t-test to study the effect of training on knowledge and skill of teacher educators. Out of 30 sample only 26 participants responded completely to the tool. So, the analysis was done for the sample of 26 only.

Results and Discussion

The objectives of the study is to study the effect of training on knowledge and skill acquisition of e-learning tools among teacher educators and the hypothesis was further divided into two sub parts:

H_{01}**:** There is no significant difference in the scores of teacher educators towards knowledge acquisition in pre and post- test.

H_{02}**:** There is no significant difference in the scores of teacher educators towards skill acquisition in pre and post- test.

Table 2: Summary of t-test for difference among Pre- & Post -test (Knowledge based)

Knowledge Based test	N	Mean	S.D.	t
Pre-Test	26	12.88	17.07	5.94*
Post Test	26	18.46	5.86	
*p > 0.05 (significant at 0.05 level)				

Results of t-test (Table 2) shows that there is a significant difference in mean scores on knowledge acquisition dimension in pre-test and post- test. The difference between the pre-phase (M=12.88, SD=17.07) and the post phase (M=18.46, SD=5.86) is statistically significant as t- value is 5.94, p > 0.05 level, so the hypothesis (H_{01}) 'There is no significant difference in the scores of teacher educators towards knowledge acquisition in pre and post-

test' is rejected. This analysis shows that there is a significant difference between mean scores of knowledge acquisition of teacher educators in the training group. This clearly indicated that the knowledge of teacher educators for e-learning tools in the training group has improved due to the training provided to them and confirmed that training effects the knowledge of e-learning tools.

Figure 1: Mean difference among Pre- & Post -test (Knowledge based)

Mean difference among Pre & Post- test (Skill based)
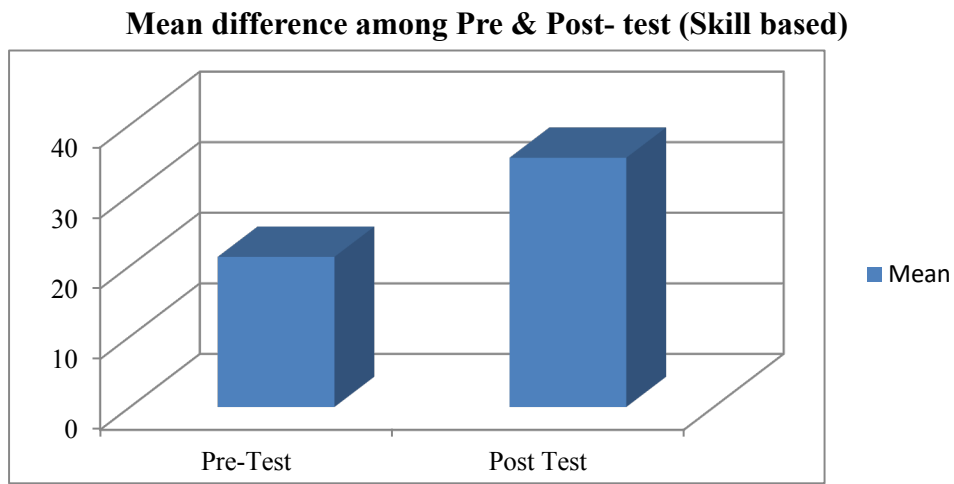
Table 3: Summary of t-test for difference among Pre- & Post-test (Skill based)

Skill based test	N	Mean	S.D.	t
Pre-Test	26	21.27	33.64	10.44*
Post Test	26	35.31	13.34	
*p > 0.05 (significant at 0.05 level)				

SD and t-ratio shown in Table 3 is showing that there is a significant difference in mean scores of skill acquisition in pre-test and post- test of training group. The difference between the pre-phase (M=21.27, SD=33.64) and the post phase (M=35.31, SD=13.34) is statistically significant, as t value is 10.4, $p > 0.05$ level, so the hypothesis (H_{02}) "There is no significant
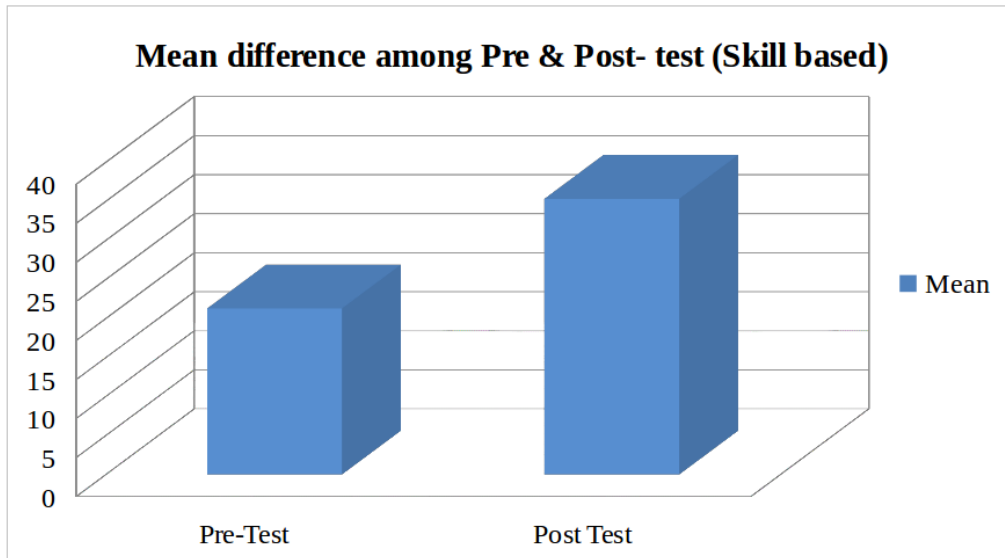
difference in the scores of teacher educators towards skill acquisition in pre and post- test" has been rejected. This analysis showed that there is a significant difference between mean scores of skill acquisition of teacher educators in the training group. This clearly indicated that the skill of teacher educators for e-learning tools in the training group is affected due to the training provided to them.

Figure 2: Mean difference among Pre- & Post-test (Skill based)

Discussion on Findings for Effect of Training

In the experiment**,** training was provided to teacher educators for various e-learning tools and findings have indicated that the training has a significant impact on both knowledge and skills of using e-learning tools of teacher educators. This result is in tune with Gulhane (2011), Karthikeyan, Shanmugaraja and Jayaraman (2012) and Parida (2010) who also found that training has a significant impact and it is a major factor affecting the usage of e-learning tools.

Many researchers suggested that training has impact on using technology Mehra and Mital (2007). Demetriadis, et al. (2003) reached similar conclusions in their research study that training efforts are generally welcomed by teachers but consistent support and extensive training is necessary in order to consider them able to integrate ICT in their teaching methodologies.

Summary and Conclusion

The usage of e-learning tools is most important now a day in teaching learning process and with the development of blended and flipped learning strategies it could be enhanced. Teacher education curriculum may include the latest topics on e-learning tools as per the requirement of next generation teachers and it may also be integrated in proper way. The policy makers may develop some guidelines in which the innovative approaches like blended, flipped learning; online learning in teacher education programmes may be elaborated. Training plays a very important part in developing the skills and in a similar way ICT component may be embedded in every training programme for teachers. Though many Teacher Education Institutions are lacking the necessary infrastructure, technical support and time but we should encourage teacher educators to integrate ICTs for implementing the curriculum and various other administrative works as well. They should be acceptable towards new approaches of teaching. They should inculcate positive attitude to accept the technology.

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Research Article

Technology Mediated Learning: Learning from the Case Study of a Government School

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Abstract

In the present dynamic milieu, innovation may well be the most important issue in any aspect of life. This holds especially true for education because it is intimately connected with different aspects of our life. Information and communication technologies (ICT), offer an array of technologies that can be used for multipurpose activities like research, teaching-learning process, assessment system, extension activities, governance, management etc. A critical role has been played by ICT along with World Wide Web, in worldwide changes that have occurred in the last few decades. These developments have bridged gaps and resulted in learning. The present paper presents observations from the case study of a school which adopted ICT as an innovation. The study is based on Government Higher Secondary School in Jehangirabad of Bhopal, Madhya Pradesh where, Microsoft sponsored Digital Learning Classroom project had been adopted. This is the first such school in the state where, this project has been implemented. The researchers intend to study the experiences of adoption of tablets by both, students and teachers of the school after training. The aspects of study would focus on the change in attendance pattern, attitude of teachers towards using new technology, experiences of students and teachers regarding their experiences of integrating technology in teaching - learning process.

Keywords: Technology mediated learning, Learning, Government school

Introduction

Today, nearly every aspect of our lives, from working to socializing, learning to playing is getting influenced by information and communication technology. According to UNESCO (2005) document, there are four stages of technology i.e. emerging, applying, infusing and transforming. India has moved beyond emerging and is presently in the applying stage. What is needed is as quick transition to infusing stage and transforming stage. The urban digital natives are fast moving towards transforming stage but, the digital immigrants and rural population are still in applying stage and at this point digital divide needs to be bridged. With initiatives like, Digital India, the gap will be bridged soon. The digital age has transformed the way young people communicate, network, travel, socialize, seek help, access information and 'learn'. The role of ICT in learning is taking a predominant form and needs to be accepted and appreciated well. The reasons for the same are pedagogical, motivational, economic, and social among others. Researches have given enough evidences about the benefits associated with incorporation of ICT in the teaching-learning situations (Sangara and

Sanmad, 2016). Information and communication technologies tend to allow a higher quality lessons through collaboration with teachers in planning and preparing resources (Ofs ted, 2002). Students get to learn new skills: analytical, including improvements in reading comprehension. It also helps in developing some writing skills: spelling, grammar, punctuation, editing and re-drafting (Lewin et al., 2000). Further, new technologies encourage independent and active learning as well as, students' responsibility for their own learning (Passey, 1999).

It has been established by studies that students, who regularly used technology, are motivated to learn (Handley, 2016; Harris, Al-Bataineh and Al-Bataineh, 2016), have increased self-confidence (Cakir, 2012) and are successful in academics (Harris, Al-Bataineh and Al-Bataineh, 2016). It is also confirmed that many students found learning in a technology-enhanced setting more stimulating and much better than in a traditional classroom environment (Pedretti and Mayer-Smith, 1998). Moreover, links have been made between computer use and constructivist, collaborative, and inquiry-based learning and pedagogical change (Scrimshaw, 2004). Some researchers suggest that computer technology can overhaul education, serving as a panacea, or as an agent of change. Generally, it is accepted that computers have the potential to enhance teaching and learning (Roschelle et al., 2000) and provide students with a learning experience that other strategies cannot provide (Wellington, 1990). Further, from the perspective of the nation's growth, disparities in the levels of ICT readiness and use could translate into disparities in the level of productivities and hence, could influence a country's rate of economic growth (Cornelius, 2003).

Many theories and different forms of learning have evolved with the use of technology in learning. Technology-mediated learning environments refer to settings in which computer-based applications and simulations, personal and mobile computing devices such as smart-phones or tablets, Web-based platforms, online or distance learning programs, video games, exhibits or installations that feature digital media, wearable technology, or other tools support participants' engagement with new knowledge, skills, or practices.

As technology becomes entwined in the culture of a society, the nation must provide its learners with relevant and contemporary experiences that allow them to successfully engage with technology and prepare them for a life after school. Governments in most developing countries have responded to these challenges by initiating national programs to introduce computers in education. In 1984, the Government of India while assessing the importance of computer in education initiated a project called Computer Literacy and Studies in Schools (CLASS) wherein, almost 12,000 secondary and senior secondary schools were distributed computers. It aimed at, well acquaintance of students and teachers with new upcoming technology and revolutionizing the teaching-learning process of the classrooms. From then onwards, education system was experimented with various kinds of technologies. The significant role ICT can play in school education is highlighted in the national school policy document called National Curriculum Framework (NCERT, 2005). Later, Ministry of Human Resource Development (MHRD) of GoI with its National Mission in Education through ICT has initiated an ICT policy in 2009. The mission was to devise, catalyze, support, sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system. It also promotes networking, research, evaluation

and experimentation in ICT tools and ICT enabled practices to utilize the potentials of ICT in school education. Later in 2012, National policy on ICT in School Education was adopted with an aim 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. The mission of the policy is to devise, catalyze, support and sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system.

The task of taking ICT to all schools in all parts of India is a daunting task and would need monetary investment of large numbers, which could not have been handled easily considering the share of education in the total budget of India. Strong partnerships between non-profit organizations, private sector and the government were suggested by Arora (2007) to create meaningful and engaging ICT-enabled content for children. So, the corporate sectors have been roped in through the Corporate Social Responsibility (CSR) programmes in the mission. Several companies like TCS, Infosys, HP India, Microsoft, Accenture, SAP, Dell and many other are contributing to different educational initiatives. The present paper is based on one such initiative of Microsoft Limited.

Literature Review

In the past couple of decades, there has been a large-scale change in the way technology has entered our lives and our youngest generation is the most adapted one. This goes well when Green and Hannon (2007) voice out that 'Our newest generation – currently in K-12 – is demonstrating for us the impact of having developed under the digital wave. These youth have been completely normalized by digital technologies—it is a fully integrated aspect of their lives'. Technology has to be integrated and adapted well into the education system and particularly the teaching-learning process. In one of the policy documents, UNESCO (2008) highlighted that the lack of ICT in classrooms means denying the opportunities to the learners to acquire skills and attributes that are necessary to participate in the 21st century. Right from the inception of motion picture till mobile technologies, whenever technology is integrated with education it has changed the teaching-learning outcomes of education (Lim et al., 2013). Researches done on technology mediated learning across the world have yielded positive results as far as participation level of learners, learner motivation, performance among leaner's, pedagogical and interactive, collaboration among learners and development of high order thinking skills are concerned. Though, literature available in India is in scarce but, globally plenty of researches are available on technology mediated learning.

According to Alavi and Leidner (2001), technology mediated learning means an environment wherein learner uses information technology while interacting with peer-groups, learning materials. Technology Mediated Learning (TML) has numerous variations and often combination of several modes. Gupta and Bostrom (2009) have highlighted that TML could be of the form web-based or computer-based, asynchronous or synchronous, instructor-led or self-paced, individual-based or team-based. Law, Pelgrum, & Plomp (2008) conducted a study on 28 countries across different continents which shows that, technology has been able to change the classroom practices and learning process. Light (2009) used a case study approach to examine the impact of an ICT tool called the Intel Teach Essentials Course in six

schools in India, Chile and Turkey. The impact of the course for teachers was with respect to a change in their knowledge, beliefs and attitudes, teachers' greater understanding of student-centred practices and an improvement in teachers' ICT knowledge and skills. With respect to students, the ICT course influenced the students' engagement with the course content, and resulted in collaborative relationships among teachers, students and parents. Shifts in pedagogical paradigms were suggested not only with respect to the teachers but, also at the educational system level. Goos et al. (2003) conducted a three-year longitudinal research in mathematics classroom at secondary level where, it was reported that technology can promote collaborative learning as well as develop better mathematical understanding. Integrating technology in India is not new. As early as in 1975 when SITE experiment was conducted, educational technology was used for capacity building of teachers. Later on, with the introduction of computers in the school under CLASS scheme, students were taught and given hands-on experience on the subject. These initial experiments with technology yielded mix results for India. According to Bhattacharya and Sharma (2007) in Kerala, a constituency Vadakkekara, is poised to be the first fully integrated e-learning constituency in the state. All schools, including primary, upper primary, high school and higher secondary schools in the Government and aided sectors, in the constituency would be brought under the project which is being implemented with the cooperation of the IT@school project and Keltron. A 50-CD library is proposed to be set up in all upper primary and lower primary schools as part of this project.

Objectives

The objectives of the research were:
- To observe the difference in attendance pattern of students enrolled in the school after the introduction of digital classroom project.
- To study the perception of children regarding use of technology in teaching-learning process.
- To study the experiences of principal and teachers after the introduction of technology in the classroom.

Methodology

Internship is the integral component of teacher education programme in India. As per the latest revised curriculum of NCTE (2014), each pupil-teacher has to undergo intensive training for six months in schools to get acquainted with various functioning of schools, including teaching. Because of this, researcher send a batch of seven students to one of the government school where, the technology mediated teaching-learning process was started. This school was selected for the pilot project in Bhopal city, to see how technology helps the learner, teacher and teaching-learning process effectively. Another aim was to understand how the underprivileged children coming into the government schools can be benefitted from technology mediated learning so that, 21st century skills can be developed among them. During student internship, this entire research was carried out. Case-study method was chosen as an appropriate for the present research. All the information collected was done through classroom observations, as well as with interaction with teachers, students and from

the interview conducted by the researcher of principal and facilitator of the project. Though data obtained from Microsoft facilitator regarding training, development of animated topic-wise module was corroborated from the students, teachers as well as from the principal while interacting with them. Few classroom observations were also done by the researcher where, teachers were integrating technology during their classroom hour. Observations on how students were actively engaged during the classroom while learning through technology was also done. Microsoft facilitator was present there from July to December 2016 for assistance if any, during the classroom session either to the teacher or to the students.

About the Project

The project is being run by Nokia Corporate Social Responsibility division, a wing of Microsoft India. The project started in the month of January, 2016 when Department of Education, Madhya Pradesh Government gave permission to start the project. It was a one-year project and culminated in December 2016. Initially, the project was started with equipping the school with LCD screen and computer with in-built projector. So, the school was connected with Wi-Fi system having online support system from Microsoft technological division. The computer system was loaded with some pre-specified modules (programmes) prepared by the Microsoft Company from the text book of class VI, VII and VIII. Modules were mostly animated in nature with lots of additional inputs related to specified topics. Teachers were trained to handle and operate the electronic gadgets. They were also trained to integrate the technology in their daily teaching. Initially, mathematics and science teachers were trained but, later teachers of languages and social sciences were trained to integrate the technology in daily teaching. Since, technology was initially handled by teachers only, tablets were later distributed to students. They were also given hands-on experience of using technology in the classroom to equip students with technological skills as well as to enable them to increase the ability of students to think creatively. In this manner, students were also trained to use tablets for self-learning. In the month of June, Microsoft distributed 45 tablets to the school with pre-loaded textbooks of class VI, VII and VIII in order to reduce the burden of carrying bags to the school. Like many private schools, students were also given on-site training of use of technology for developing technological skills as one of the essential skills for 21st Century.

Only one room was made technology enabled therefore, timetable of class VI, VII and VIII was set in a manner where, per day one subject teacher took the classroom in technology enabled room. Teacher started his/her classroom by presenting the topic to be taught on that particular day (modular and animated form). Teachers encourage the students to ask questions related to the topic. Further, teachers asked the students to seek and explore more about the topic using tablets and available Wi-Fi connections. Both these processes helped the students to comprehend the topic more effectively. Microsoft Educational Division has also developed an evaluation tool called rubrics through which, they measure various aspects of 21st century skills like, communication, technological, creative skills and thinking skills, etc. Students not only explored the content but, also prepared projects, searched for words and meanings, videos related to the content, etc. in their period. Later on, teacher prepared a PowerPoint presentation or digital lesson plan in consultation with the Microsoft facilitator. Students were also provided with other resources in their tablet on the topic being taught in

the class. Similarly, teachers were also provided with resources related to the topic by the Microsoft, to make the content more comprehensible. Presently, teachers and students are utilizing the technology for teaching-learning process. Since one classroom is equipped with technology, therefore, school timetable is set in such a manner that once a week each class from Class VI- X is taught through technology for a period of almost 90 minutes. As the project was initiated by Department of Education, M.P. Government for its efficacy, therefore, all the material and resources given by the Microsoft Company to the school was the property of Education Department which can't be shared with others as a matter of policy. So, details of the content could not be shared with the researcher, completely. The project got ended in December, 2016 and Microsoft Company facilitator was moved out of the school. As per the latest information project was not extended to other schools. Though, school and its teachers were utilizing their training to teach students through technology as they had learned in the training and through their own experiences.

About the School

The Government Girls Higher Secondary School is located in Jehangirabad at old Bhopal. The school is located in a very congested place mostly inhabited by people of low socio-economic status. The percentage of Muslims has larger share in the total population in the area. If we look at the occupational status of the parents of the children studying in the school, majority of parents are found to be working as street vendors, motor mechanics, daily casual labourers, or working in some shops. Recently, government of Madhya Pradesh has started English medium sections in some of the schools in Bhopal and this school is one of them which is running a section of English medium along with Hindi medium of instruction.

Main Findings

Data collected from different tools and sources has been clubbed under several headings for the ease of understanding.
- Attendance pattern of students – Attendance in classrooms is one indicator for knowing the effectiveness of teaching-learning process. A basic indicator of opportunity to learn, in Elaine Allen Worth's view is, student attendance. "If kids are not in school, they are not learning," she observed, and proposed an indicator of, school attendance by age. Data collected from the attendance register has been encapsulated in the following table:

Table 1: Class-wise Average Attendance

Class	Total Enrolment	Average attendance per month					
		Previous year	July	August	September	October	November
VI	50	30	39	42	44	42	45
VII	47	33	38	41	45	39	43
VIII	55	37	42	45	49	43	47

From the above table, it is easy to decipher that the attendance has improved since the introduction of the project in the school. Attendance is often viewed as a trivial or low-level predictor, she added but, it is highly predictive of eventual educational attainment. This is because, it influences learning, grades, and graduation rates. Thus, increase in attendance is promising for the teachers, the teaching-learning process and the project too.

- Experience of the learners – Learners were excited to share their experiences of learning with 'tablets'. They equivocally said that they are learning new things and they enjoy more when they are learning through tablets. It was reported that students tried to look for new information on tablets on their own also, which aids self-learning. Students reported that absenteeism from the school was common. But, as teachers started taking classes with the help of technology and students were made to use tablets for learning process, they avoid taking leave from the school. Now, they find learning to be joyful and enriching and they do not miss the school. These positive experiences of the learners pave a way for effective learning. Poole and De Sanctis (1990) suggest three dimensions that indicate appropriation: faithfulness, attitudes and level of consensus. This means, technology structures will only have their intended effect if the design principles are kept intact (faithfulness), if members do not react negatively to it (attitudes), and if members agree substantially over how structures are used (consensus).

- Experiences of the teachers – Before understanding the experiences of the teachers, a short demographic detail of the teachers can be given. In all, thirteen teachers from the school, of different subjects, were trained by the Microsoft trainer. Out of these, four teachers were males and rest nine were females. All the teachers were trained teachers having at least graduation degree with either LT/B.Ed./D.El.Ed. degree. The average age of teachers in the school was 46.6 years. The seniormost teacher was 58 years old whereas, the youngest teacher was 40 years old. All the teachers had minimum 12 years of teaching experience in various government schools of Madhya Pradesh.

During the focused group discussion with the teachers, the researcher observed that there was initial resentment or fear among them about the use of new technology in the teaching-learning process. During discussions with them it was said:

'*Hum classroom mein blackboard par padhane wale log the aur achanak yeh technology – hum nahi chahte the ki hume padhane ke tarika badalna pade*'.
Since it was a pilot project started by the state government with Microsoft company, so it started in five different districts of Madhya Pradesh including, Bhopal. They appreciated the role of Microsoft trainer and their school principal who encouraged them to adapt to the new technology. The training was valued for making them learn the use of new technology. While talking to Microsoft trainer, the school principal

reported that there were lot of apprehensions among teachers about learning and using technology and it took teachers six months (January to June, 2016) to get trained. This included, use of technological devices and integration of technology in teaching-learning process. Microsoft trainer also helped teachers to develop small modules (lesson plan) on different topics. Teachers had to be convinced that they can learn technology and use them for their own benefit and for the benefit of their students. Microsoft trainer also ascertained that after the initial phase of training, teachers started using technology for themselves and for their students, making the teaching-learning process interactive and joyful. As one of the teachers among them said, '*mujhe ab mazaa aata hai ab main class mein padhaane ke liye aati hun to bachhon ke chehre ki muskan mujhe khushi deti hai*'.

They further opined that learners were curious and eager to learn. They themselves felt that the process of teaching has become easier. Teachers felt that a new environment has been created in the classroom. The attendance pattern of learners has changed and there is an increase in punctuality and attendance of learners in the classroom. They further showed their gratitude to Master Trainer of Microsoft for helping them in learning technology the manner in which technology would be integrated in the classroom learning.

From a teacher's perspective, Deghaidy and Nouby (2008) have suggested a blended e-learning approach required for new pedagogic skills so that, the learner gains the most from the course. Further, they have also highlighted the effectiveness of handling technology in different in-service programmes. They have further emphasized on hands-on experience and its benefits.

- Experience of the principal – The school principal was very optimistic about the project. The initial 'excitement' about technology among the learners and an initial 'hitch' among the teachers was felt at the beginning. But, the positive effects of technology integrated learning could be gradually seen in attendance, level of curiosity, punctuality, and the general confidence of the learners. The recent inspection of the school by an outside group also gave a positive feedback with regard to the performance of learners. The collaborative efforts of teachers and learners was appreciated in making the project a success. Teachers, especially of Urdu language were found to have well adapted to the technology. Teachers have been able to use the LCD projector and other things comfortably for regular teaching exercise and the efforts of the Microsoft team was lauded.

- Experience of the trainer – The training of teachers for use of technology for teaching and integration of technology in teaching-learning was found difficult by the trainer. The unfavourable attitude the teachers had regarding adoption of new technology was held responsible for this. However, gradually the teachers have been found adapting to these technologies and learning. The trainer was found to be more optimistic about the learners because, the amount of efforts put in by them was large to learn the use of new technology.

The trainer opined that the adoption of new technology seems to have made the teaching-learning process more enjoyable especially, for learners. The team aimed at developing digital lessons for teachers which would further add impetus to the teaching-learning process.

Conclusion

Technology has the potential to support curriculum and policy reform. However, reform efforts alone will not cause the necessary change. There is a reciprocal relation between reform and technology. As Means (1994) argued, technology drives reform in education, but also 'education reform makes a school ripe for technology' (p. xii). It should not be assumed in any case that once technology is introduced in schools, reform will automatically take place. Reforms can happen only when technology is integrated in schools through in-service professional development of teachers, reform during pre-service training and reform of pedagogical practices from teacher-centred to student-centred approaches. This not only calls for increased efforts but, also financial assistance.

It is an accepted fact that for successful technology integration, there needs to be a shift in pedagogical approaches which requires reforms of teacher education programmes. With the study of literature and the research on the concerned project, it can be argued that if technology has to be made an integral part of instruction in elementary and secondary schools, then changes need to be made in teacher education both, at pre-service and in-service stages. This would prepare the prospective teachers as well as practicing teachers for better integration of technology in the teaching-learning process. This further implies that emphasis needs to be placed on policy and curriculum reforms as, they relate to the use of information technologies for teacher education.

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Review Article

Modalities for Successful Language Learning and Teaching in the Digital Age: A Critical Review of Language Learning Software and Applications

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Abstract

One of the main factors influencing the effective learning of a second or a foreign language among students is the language learning style and strategy followed by them (Oxford, 2003). However, in recent years', the advent of information and communication technology has essentially changed the way people communicate and the way languages are learned, thereby also affecting our students (NCERT, 2005). This is specifically true in the case of the wide range of a second or a foreign language learning applications and software programs that are available online or in the downloadable format offering multiple ways for learning a language. Therefore, in order to ensure quality upgradation in language learning and the development of a multilingual society, the traditional way of teaching and learning language might not be enough. However, before mindlessly adopting these new technologies for learning a language, it is important for educators to critically assess their utility. The current paper aims to identify the five most used language learning software or applications through various online and offline ratings, user base and review boards. The paper also aims to critically examine and present a comparative review of these language learning tools basis the number of languages offered; learning strategies applied, styles and skills in focus; users' reviews; and the cost of their premium packages. A 'language learning skills and strategies' checklist was developed to collect data. The data so collected was thematically organized and analysed in the light of contemporary theories of language teaching and learning. Finally, the paper concludes with the modalities required for efficient and effective teaching and learning of language in this digital age. The current paper also encourages teachers, teacher educators, parents, and students to experiment in teaching and learning of a second or a foreign language with these softwares and applications.

Keywords: applications, digital age, language learning, language skills, multilingual society, educational technology

Introduction

In response to the challenges posed by the 21st century, education struggles to re-shape itself with the help of technology, thereby fundamentally changing the way we teach and learn. Learners, today, are increasingly motivated by their personal needs and situations such as the need of greater mobility from one place to another, and hence find themselves in a position to engage themselves in educational activities on-the-go, that is spontaneous and sometimes also have 'life-long learning' as an ambitious goal. This leads to the use of a variety of technologies by these learners, both inside and outside classrooms. At their very first appearances, many new media technologies; such as dictionaries, grammar books, audiotapes, television programs, DVDs and CD-ROMs, the internet and mobile technologies;

seem to have great potential for assisting in language learning (Sharples, 2000). Some of these technologies, commendably fulfilled their promises while others failed to do so (Salaberry, 2001). Many linguists and language experts attribute several reasons for the failure of language-learning technology. Some of the reasons can be the inappropriate or insufficient use of technology, questionable pedagogy that is sometimes a step backward than being a step forward (Warschauer & Healey, 1998). Also, there is often little attention paid to the behaviours and attitudes of language learners with regard to the technology that they are using (Pemberton et al, 2005). Foreign language learning, as well as second language learning, are arguably well suited for learning through technology and also with life-long learning. Language learning, in itself, is an everyday learning activity that is integrated with individual's lives and as this activity changes, one can also see the transformation in how languages are learned and also what challenges these changed ways presents.

This paper presents a comparative analysis of software and mobile applications available for language learning in terms of their popularity, the number of languages offered, cost-of premium packages, design functions and the strategies and styles of language learning in-focus for a learner-centred approach for language learning. With such a comparative analysis, the paper presents various modalities for effective and efficient teaching and learning of language in the digital age to the readers.

Theories of language learning

While reviewing different theories of adult language learning, Mitchell and Myles (1998) point out that the researchers haven't yet arrived at a comprehensive and unified view of second language learning among adults. Language learning in itself isn't a unified activity. It has been conceptualized as an amalgamation of different activities of listening, speaking, reading and writing and at times also comprehension. Various theoretical orientations for second language learning exists today, however, as per the scope of this study, this section only discusses the constructivist view and the creative constructionist approach.

The constructivist approach towards language learning asserts that learning of language is a socially interactive, creative and active process wherein learners construct new ideas on their own, on the basis of their current and previous knowledge (Bruner, 1990). This philosophy or orientation of language learning is indeed the force behind many interactive, computer-assisted language learning initiatives. This orientation is also often seen as to be closely knit with a communicative teaching approach.

Learners construct their knowledge through negotiating the meaning of their dialogues and socio-cultural expressions in the target language. This implies that it is only through the learners' exposure to and interaction with the target language and its contexts that successful language learning can occur. According to Pemberton et al (2005), in a constructivist-inspired program for language learning, learners are required to solve problems, perform different tasks involving different skills, thereby ensuring high levels of interaction in terms of listening, speaking, reading and writing in the target language.

The second orientation is that of the Creative Constructionist approach. This approach is mainly associated with the works of Krashen (1981). According to Krashen, the learners or acquirers of language usually are not aware of their learning of a language. Rather, such

learners intuitively acquire the second language while they are engaged in the process of receiving and comprehending inputs in the second language. These inputs can be received from various sources of the same, lower or slightly higher level than that of the learner's current level of competency. Such inputs directly contribute towards the incidental or implicit acquisition, comprehension and subsequent fluency in the second language. This acquisition takes place internally through hearing and reading of that language, and the learners are not required to actively speak or write in that language because it is assumed that speech in that language would emerge as a natural consequence of repetitive hearing of samples in the language to be acquired. According to Krashen (1981, 1982) and Trueba (1987), the learner's motivation to learn a language is also an important determinant of its successful learning and therefore, it is important to ensure that the environment in which learning is occurring are highly motivating in nature and the fact that any deliberate language learning is occurring should be seamless.

Objectives

The current study aims to achieve the following objectives:

- To identify the five most used language learning software or applications.
- To critically examine and present a comparative review of these language learning software and applications on the basis of the number of languages offered; learning strategies, styles, and skills in focus; users' reviews; and cost of the premium package.

Methodology

In order to identify the top five language learning software or mobile applications, an in-depth review of various online and offline ratings, user base and review boards were conducted. Such sources for such review ratings included Bloomberg Pursuits (Ekstein, 2017), Western Union (Timothy, 2017), The Balance (Fisher, 2017), Digital Trends (Hill, 2017), PCMAG.com (Duffy, 2017), beebom.com (Beebom, 2017), and Lingualift (Krzeminska, n.d.). After reaching at the list of top five language learning programs, further review of each of those was undertaken. For this, a 'language learning skills and strategies' checklist was developed. In addition to the in-focus skills, the checklist also contained several program-based basic indicators such as format, till-date user base, number of languages offered, the average duration of the lesson, cost for access to the full package and other additional features offered by the program. The data so collected was thematically organized (in the form of a comparative table) and analyzed in the light of contemporary theories of language teaching and learning.

Results

Many language learning programs appeared in the review boards' list of best language learning apps/software/programs. These included programs such as (in alphabetical order): 24/7 Tutor Apps, Accella Study Essential Apps, Babbel, Busuu, Clozemaster, Coffee Break, Drops, Duolingo, Fluenz, Google Translate, Hello Talk, HiNative, How To (Pronounce), Leaf, Lingua.Ly, Lingvist, Living Language, Memrise, Mindsnacks, Mondly, Mosa Lingua, Rocket languages, Rosetta Stone, Simon & Schuster Pimsleur Comprehensive, Tandem, Transparent Language Online, TripLingo, Yabla. Out of these language learning programs,

the ones that were found to be most recurring are (in an alphabetical order): Babbel, Busuu, Duolingo, Memrise, Rosetta Stone (Beebom, 2017; Duffy, 2017; Ekstein, 2017; Fisher, 2017; Hill, 2017; Krzeminska, n.d.; Timothy, 2017). An in-depth review analysis of each of the top five language learning programs will follow in the following sections. These sections are arranged not with respect to any particular hierarchy of popularity or effectiveness of a learning program, but with respect to alphabetical order. Throughout this paper, no attempt has been made to suggest that one language learning program is better than the other.

Babbel

Babbel, founded in 2007, is a language learning program available both as a website and as a mobile application for both Android and IOS devices. The user base of Babbel (at the time of writing this paper and as reported by its official website) is of about one million active paying users and has an approximate growth rate of thirteen hundred new users per hour. This program offers learning courses for a total of fourteen languages including German, Spanish, Italian, French, Portuguese, Swedish, Turkish, Dutch, Polish, Indonesian, Norwegian, Danish, Russian, and English. This program uses a didactic method for teaching language which is combined with strategies from cognitivism, and constructivism. The program starts by exposing the learners to a lot of new vocabulary at once, which, at times, can be overwhelming for some learners. However, the program uses the cognitive principle/technique of 'Space Repetition' which ensures that each new vocabulary introduced to the learner is repeated several times, at different occasions/intervals thereby helping the newly acquired information to move from the short-term memory to the long-term memory of the learner. The vocabulary introduced to the learners is largely based on the real-life native conversations in the target language such as greetings of 'Hello', 'Good Morning', 'How are you?'. According to the developers of this program, such an approach can help learners to start conversing in the target language right away. Although the program focuses on listening, reading, writing and speaking skills in a language, there seems to be a skewed focus on listening and writing skills of the learner. Apart from offering flashcard style vocabulary, the program also offers quiz style course elements, pronunciation and grammar training exercises. Although the amount of lessons available for each of the languages offered varies greatly, the lessons that are designed are presented to the learners keeping in mind the context of the learner, specifically the native/instruction language of the learner, over which the learner already, assumingly, has a greater level of mastery. This means that the presentation, of course, is done keeping in mind the overlapping grammatical structures and mutual words of the native and the target language and also the mutual. However, if the language complexity is considered, this program offers courses only for the beginner's level and not much content available for upper intermediate and beyond levels of proficiency in the targeted language. Some of the additional features offered by this program include Speech recognition tool (tests learner's pronunciation), Review manager tool (keeps track of vocabulary practiced by the learner), Social media tool (helps learners to interact and connect with other learners). Babble's method of learning does not offer any real-time web classes. Critics also reveal that such a method of learning can at times be monotonous for the learners and may end up losing its effectiveness in new language learning.

Busuu

Busuu, founded in 2008, is a language learning program available both as a website and as a mobile application for both Android and IOS devices. Busuu is basically a social network for learning languages that is based on a freemium business model, i.e. it has two versions, free and the premium version. The free version gives access to only flashcards and the premium version, that is paid, includes, in addition to flashcards, adaptive vocabulary trainer, grammar exercises, quizzes, podcasts, videos, other multimedia material, speaking-writing assignments, personalized feedback from other users, offline mode, travel courses, and McGraw-Hill certification. This program offers learning courses for a total of twelve languages including Arabic, Chinese, English, French, German, Italian, Japanese, Polish, Portuguese, Russian, Spanish, and Turkish. Busuu provides tools such as chat-window that enables different learners to network amongst each other. This platform also encourages collaborative learning with a growing community of native speakers. One feature of this program is that the users can act as both learners (of a target language) and tutors (of their own mother tongue) and hence correct each other's work. Busuu courses are offered at different levels of proficiency, i.e., A1, A2, B1, and B2, which indeed are based on the Common European Framework of References for Languages (CEFR) standards. At the very beginning, this program also offers to take up a base-line proficiency test called as the 'placement test' for those learners who already have some level of proficiency in the target language and thus the program suggests level appropriate courses to the learner. These courses focus upon the four main skills of language learning (i.e. reading, writing, speaking and listening). The course contents are well organized on the dashboard allowing the users to see exactly where they are and choose to either move sequentially from one level of proficiency to another or pick up courses/topics that best suit their needs or continue practicing the tasks/courses they have already completed. The courses are designed as such that each new learning builds upon the learner's previous knowledge, thereby allowing easy scaffolding rather than exposing learners to random, disconnected, and decontextualized content such as vocabulary flash cards or grammar lessons. Each lesson is designed around a communicative focus (such as greeting someone, introducing oneself, ordering food at a restaurant) so that the learners can apply their learning immediately in writing or conversation. Once the learners have completed one set of tasks/course, they can also take fill-in-the-blanks, MCQ, sentence-completion and other quiz-like tests to test their knowledge. For each test taken, the learners get stars based upon their performance. Some exercises also require the learners to record, speak, type an answer and submit it to the native community for correction and feedback. As a tutor, one can also provide cultural notes to other learners, thereby further enriching a learner's experience of learning a language and building communities of learners in a real sense of the term. However, a drawback of this approach is that since the tutor and the learner may not know each other personally or be aware of the exact level of each other's proficiency, the comments given by one person may not be understood by the other at a different (usually lower) level of proficiency. One important thing to note here is that this program would work best for learners who are self-motivated to learn a language.

Duolingo

Duolingo, launched in 2011, is a language learning program available both as a website and as a mobile application for both Android and IOS devices. This program is completely free without any hidden charges or premium packages. This program offers learning courses for a total of twenty-seven languages including Spanish, French, German, Italian, English, Portuguese, Dutch, Irish, Danish, Swedish, High Valyrian, Russian, Swahili, Polish, Romanian, Japanese, Greek, Esperanto, Turkish, Vietnamese, Hebrew, Norwegian, Ukrainian, Hungarian, Welsh, Czech, and Korean. This program runs on a core principle of making learning fun with the help of gamification of the content to be learned. Languages are split into bite-sized skills that feel like games. Players/users gain points when they complete a lesson and lose a life (Heart) when they answer incorrectly. The learners can also buy certain powerups from the 'Lingot store' in exchange for the Lingots (Duolingo's virtual currency) gained by them after completing challenges/levels. The length of these lessons is completely customizable by the learner depending upon the amount of information they can absorb from a single lesson. Each lesson focuses on reading, writing, speaking and listening skills by including a variety of translation, MCQ, listening and speaking skill-based challenges. The lessons are designed on certain "skills" (as conceptualised by the program), i.e., the learner will get lessons on food, animals, phrases, accusatives, plurals, adjectives, possessives, occupations, numbers, locatives among many more. For those learners who don't perform so well on a challenge, the program further guides them for improvement. One feature that really helps in keeping the learners motivated (apart from the gamification) is the program's feature 'Streak count' feature which keeps a track of the number of consecutive days a learner spends for learning a language. Apart from the free language learning content, this program also offers its users to undertake an online Duolingo English Test (DET) that testifies and certifies the users' English language proficiency. The DET has been accepted by various leading institutions such as Tufts University, Harvard Graduate school of Design, Harvard Extension School, California State University, NYU, UCLA and many more. The program also gives its users' access to the Duolingo Labs where the learners can expose themselves to the Duolingo's experimental projects such as 'Duolingo Stories', 'Duolingo Events' etc. The 'Duolingo Incubator' feature enables bilinguals to share their knowledge and hence contribute towards the courses.

Memrise

Memrise, launched in 2010, is a freemium language learning program available both as a website and as a mobile application for both Android and IOS devices. This program offers 10 languages (French, German, Spanish, Korean, Italian, Japanese, Russian, Chinese, Arabic, and Turkish) along with other computer languages like JavaScript and Python. The courses focus on making learning joyful and offer courses not just belonging to language learning but also to other disciplines such as Arts & Literature, Maths, Science, Natural World, History, Geography, Entertainment, Trivia and so on. The main attraction of this program is that this program is a user-generated and supported program, i.e., it utilizes its community of learners to improve and also teach language to other users. It uses a multimedia approach of presenting the course content and also stresses on memorization of vocabulary based on audio and image flashcards that help the learners with easy association of words. Along with word association, other memorization techniques and strategies such as 'Mnemonics',

'Elaborate Encoding' (new words are actively linked with words that the learners are already familiar with) are also frequently used by the program.

Rosetta Stone

Founded in 1992, this program is a proprietary program aimed at providing language learning courses across 19 languages. One of the main features of this program include 'Dynamic Immersion'. It further includes the use of multimedia exercises for vocabulary building, speaking, listening, reading and writing. It also offers the learners to delve into the world of literature, thereby encouraging them to learn by reading stories and also immerse themselves into the culture of the target language. Also, through the feature of 'Rosetta world,' the users can play games and speak with other learners. Another striking feature that is not offered by any other programs discussed so far is that of 'Live Tutoring' under the name of 'Rosetta Studio'. Hence, an attempt is made to completely immerse the learner into the world of the target language. As a result of this, the learners absorb the language along with the culture, without any deliberate attempt (similar to the Creative Constructionist Approach). Table 1 presents more information on this program. It also presents a comparative view of all the five language learning programs discussed so far.

Table 1: Comparison of language learning programs

	Babbel	Busuu	Duolingo	Memrise	Rosetta Stone
Format	Website, Mobile App (IOS, Android)	Website, Mobile App (IOS, Android)	Website, Mobile App (IOS, Android, Windows)	Website, Mobile App (IOS, Android)	Website, Amazon, Mobile App (IOS, Android)
User Base	1300 new users per hour in its sixth year and 1,000,000 active paying subscribers	70 million registered users, growing at an average of 25,000 per day	150 million (Guliani, 2016)	26 million	Data unavailable for the year 2017 (over 9 million in 2014)
Cost of Full Package (Premium version)	$6.95 per month, per language, for a period of twelve months	€ 5.83 per month for a period of twelve months	FREE (DET certification fee is $49)	$ 4.90 per month	$ 10.75 per month for a period of twelve months
Number of languages offered	14	12	27	10 (excluding computer languages)	19
The Average duration of each lesson (mins)	5	10 minutes per day	4	Customizable	30

Skills/areas in focus	Pronunciation, Listening, Reading, Writing, Speaking for both visual and auditory learning types (mostly only at beginner's level)	Reading, Writing, Listening, Speaking (from beginner to intermediate level as per the CEFR standards)	- Conventional skills of Reading, Writing, Listening, Speaking - Duolingo skills: food, phrases, plurals, adjectives, numbers, etc.	Reading, Writing, Speaking, Listening, Grammar, Pronunciation	Reading, Writing, Speaking, Listening, Grammar, Pronunciation
Strategies used	- Didactic method combined with cognitivist, behaviourist and constructivist strategies - Real-life conversations - Spaced Repetition - Building each course on learner's native language and personal interests	- Collaborative, cooperative learning - Communicative focus of each lesson - Variety of tasks and tests in multimedia formats - Personalized feedback system - Builds upon learner's previous knowledge	- Gamification of learning - Reinforcement in terms of gaining of virtual currency or loosing of lives - Community involvement	- Memory strategies such as Mnemonics, - Elaborate encoding - Spaced Repetition - Gamification of learning - Community involvement - Reinforcement (in terms of level and ranks) - Choreographed testing	- Dynamic Immersion - Multimedia learning approach
Additional features	- Speech recognition tool - Review manager tool - Social media tool	- Social networking tool - Offers placement test	- Offers placement test - Streak count - Offers DET - Offers access to Duolingo Labs - Duolingo incubator - Social media tool	- Offers scheduled reminders - Offers computer languages (JavaScript, Python) - Offers courses in other school and university subjects - Humorous chatbots	- Rosetta studio - Rosetta World

Conclusion

It is clear from the above cases and their comparison (as presented in Table 1) that all these five language learning programs (in alphabetical order), i.e., Babbel, Busuu, Duolingo, Memrise, and Rosetta Stone, do not support individualised instructions as the content material is largely the same for all learners. Four out of five of these programs run on a freemium business model and offers around ten to nineteen languages. The languages offered by these programs are usually the ones that belong to the more dominant and powerful regions of the world or are widely spoken across the world. A separate and different discussion is required to establish this point, which currently is not under the scope of this paper. Most of these programs (Babbel, Busuu, Duolingo, Memrise) divide the act of language learning into constituent skills/components that can be covered/mastered through bite-sized lessons. Thereby following the constructivist view of language learning whereby the learner is consciously aware of his/her act of learning a language and actively construct their knowledge through interacting and negotiating the meaning of their dialogues and socio-cultural expressions in the target language. Rosetta Stone, on the other hand, seemed to operate on the Creative Constructionist Approach whereby the learners are not outwardly aware of their learning of a language, rather, they acquire the target language as a result of immersion into the linguistic environment while being engaged in the process of receiving and comprehending inputs in that language. The strategies used by all these programs also vary. It was realized that more analysis needs to be done in this area to better understand the implications of using each of these or any other language learning programs. Future researches in the area can further look at learner's experiences and the implications thereof. Therefore, the paper encourages teachers, teacher educators, parents, and students to experiment teaching and learning of second or foreign language with these programes and further contribute to the discourse of modalities required for efficient and effective teaching-learning of foreign languages in the digital age.

(Disclaimer: The views expressed in this paper are personal to the author and do not necessarily represent the views of the author's employer, organisation, committee or other group or individual.)

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General Article

Community Radio and its prospects in Education

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SMART, Email: archana.smart@gmail.com # With inputs from Ashfaaque E.J., Researcher
and Filmmaker)

Abstract

Radio is a powerful mass medium that informs, educates, is inclusive, preserves the local identity of communities and helps reach out to and empower marginalized sections of society. In developing countries, it can add value in several ways, particularly in areas where information, knowledge and technology come at a cost. It has the potential to fill the gap that exists in schools by providing quality education, vocational and skill training to disadvantaged students. The article begins by tracing the history of radio with a focus on the experiments of radio in education across the globe. This ranges from, the BBC's schools broadcasting services in 1924, and programmes for underprivileged children by AIR Madras, to the educational FM channel Gyan Vani being launched in India in 2011. Steering towards the importance of Community Radio and its potential to reach out to under-privileged communities, the paper highlights the educational initiatives launched with community radios by National Council for Science and Technology Communication (NCSTC) in India. The paper also addresses Interactive Radio Instruction (IRI) - a teaching methodology that makes learning fun and evaluating its success stories in India and abroad. Various local-level efforts that have helped in reaching out to the marginalized sections in lieu of improving education has also been discussed.

Key words: Community Radio, Community radio in education, Role of radio in education, Radio Mewat, Radio Media Village

German playwright and author Bertolt Brecht wrote, "Radio is one sided when it should be two. It is purely an apparatus for distribution, for mere sharing out. So, here is a positive suggestion: change this apparatus over from distribution to communication. The radio would be the finest possible communication apparatus in public life, a vast network of pipes. That is to say, it would be if it knew how to receive as well as transmit, how to let the listener speak as well as hear, how to bring him into a relationship instead of isolating him. On this principle the radio should step out of the supply business and organise its listeners as suppliers (Thomas, 2011). The playwright's words highlight the sole purpose of communication as participatory when radio and all other mediums were treated by the state as a source for distribution of information. Citizens are reduced to passive audiences who lend out their ears to mere propaganda and news about various welfare schemes. Their voices are ultimately absent or get lost. This is exactly what can change if Radio serves as an interactive and collaborative medium for communication - a tool for education.

Radio is a powerful mass medium that informs and educates, is inclusive, and preserves the local identities of communities and helps reach out to and empower marginalized sections of society. In particular those, who have missed out on access to opportunities on account of not

having adequate resources - both financial and social. In developing countries, the radio can add value in several ways, particularly in those areas where information, knowledge and technology come at a cost. If we look at the status of education in India, even today in most of the rural areas, schools are without teachers, training tools, lab equipment, libraries and other basic facilities. Radio has the potential to fill this gap by providing quality education, vocational and skill training, particularly, to the disadvantaged students. As an important instrument of mass media, it can complement the formal system of education.

On February 9, 1995, in a historic verdict, the Supreme Court of India said that airwaves are public property and their use "has to be controlled and regulated by a public authority in the interests of the public and to prevent the invasion of their rights" (https://mib.gov.in/document/supreme-court-judgement-airwaves). The apex court's judgment rejected the government's monopoly on broadcasting and democratised the broadcasting space. The court made it clear that "the right to impart and receive information is a species of the right to freedom of speech and expression guaranteed by Article 19 (1) (a) of the Constitution" (https://mib.gov.in/document/supreme-court-judgement-airwaves).

This was a major turning point for Radio in India that saw a spurt in action to make community radios a reality in the country. A community radio station - owned by the people, of the people, and for the people - could become a possibility. In 1996, the Bangalore Declaration (Noronha, June 1998) of media was signed in the presence of 60 people from various sectors including radio broadcasters, policy makers, academicians, media professionals and activists. The Declaration proposed the democratisation of media and focused on many aspects apart from entertainment. The discussions, which suggested a liberal policy for radio broadcasting, stressed to establish a democratic, dynamic and community-oriented communication system at the earliest. The Bangalore Declaration proposed the institutionalisation and expansion of the concept of community radio stations. In the year 2000, the Pastapur Initiative on Community Radio Broadcasting emerged out of a UNESCO sponsored media workshop in Telangana. In December 2002, the Government of India approved a policy for the grant of licenses for setting up of Community Radio Stations to well established educational institutions, including the premier Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs). Anna Radio, at EMMRC, Anna University, Chennai, the first community radio in India, was launched in 2004. The policy was revised in 2006 when grass-roots organisations and other not-for-profit organisations were also granted permission to set up community radios in India. Today, there are approximately 258 community radio stations operating across India.

The evolution of community radio is the result of years of struggle and media activism. Rather than acting as the mouthpiece of the system, community radio lends power to the people. The effort to access the radio communication technology by the communities started just before the First World War (King, G., 2017, pp.18–36). During this period, many community radio practitioners challenged the state and contested the private domination of airwaves. In North America, many community radio lobbyists and activists jammed the radio dial on US- Canada border. Most of these radio activists pirated the broadcast law and continued as unlicensed broadcasters challenging the monopoly. While several histories of community radio exist here is a brief overview: By the 1940s, the community radio

practitioners started to set up their own permanent infrastructures. Latin America's 'Radio Sutatenza', was considered as the world's first community radio. It was established in 1947 by a Roman Catholic priest, Jose Joaquin Salcedo, in Colombia. During the late 1940s, Bolivia witnessed a revolution in the communication field. 'Radio Mineras' was launched in Bolivia in 1949. The station was maintained by the mining workers of Bolivia and it advocated their cause. By 1952, at least 26 community radio stations were maintained by the miners' trade union and workers in Bolivia. The radio stations soon became the political voice of the Bolivian miners who openly talked about their harsh living conditions and aired news related to Union meetings. The radio stations played a key role in organizing the labourers and boosted the working class' resistance. Most of these community radio stations operated with funding from the community itself. The ownership of the channel that vested in the hands of workers changed the social fabric. The Bolivian model inspired the media activists, lobbyists and dreamers alike all around the world, to start similar initiatives (Fraser et al., 2002).

Community radio is something that "emerges from within the community and which couldn't and shouldn't be imposed from above" (Jallov, 2017). The radio programmes should be designed on the basis of community access and it should reflect the necessity and interest of the community it serves. Community radio stations should focus on the local language and should design programmes that take into consideration the local context, and promote local culture, identity, diversity and aesthetics. Advocates of community radio have argued that the role of community radio is to:

6) Empower communities by giving them control of running the radio

7) Promote and build local identity, preserve local dialects, culture and music by focusing on local content

8) Encourage participation from all sections of society and create opportunities for diversity of voices, opinions, dialogues and discussions and strengthen democratic processes

9) Become an agent of social change, inclusion and development

10) Increase awareness about rights and responsibilities, bring about transparency, and promote good governance (Singh, 2018)

The use of radio for educational purposes was piloted with the BBC's schools broadcasting services as far back as in 1924. But, it started playing a pivotal role in education in India only since 1929, when the Radio Club of Bombay started to run children-oriented informal educational programmes on radio. This was followed soon by AIR Madras that started broadcasting a special programme for underprivileged students in 1930. In November 1937, Calcutta AIR started broadcasting systematic educational programmes on a special request from Calcutta University and the educational department of Bengal government. In 1937, the School Broadcast Project was experimented in four metro cities (Delhi, Calcutta, Madras and Bombay). The experiment was quite a success and fuelled similar initiatives (Kurrien, 2008).

In 1956, Adult Education and Community Project (Radio Forum Project) was tested in 144 villages of Maharashtra with the help of UNESCO. The villagers could listen to a thirty-minute radio programme on agricultural or community development, then discuss and decide regarding its adoption in their own village. The participatory project became a huge success. Following this landmark project, the first higher education programme was tried out under the University Broadcast Project in 1965. The School of Correspondence Studies of the University of Delhi and the CIEFL, Hyderabad, designed the education programmes for AIR. The programme was mainly of two types- 'general' & 'enrichment'. The general programmes covered public interest topics and the enrichment programmes focused on correspondence education offered by universities. The 'Language Learning Project, that started in 1979-80, was another landmark project in the educational sector. It was a joint venture of the All India Radio and the Education Department of Rajasthan Government to teach Hindi to school going children. The project was implemented in 500 primary schools of Jaipur & Ajmer districts on an experimental basis. Vocabulary skills of many students improved on account of this project. (Vyas, V & Sharma, Ramesh & Kumar, Ashwini, 2002).

There is no doubt, however, that amongst all the available means of communication, radio has the maximum reach in India, as in most developing countries. In countries where basic infrastructure is lacking like roads and electricity, and facilities like that of sanitation, equipment and teachers are absent, radio can play a major role in providing low cost education to children. (*There are several examples particularly that of Radio Mewat, which are discussed later.)*

While, television is rapidly expanding in urban and rural areas, access to radio networks and ownership of radios is far more widespread, as 97% of India's population can access radio stations. Moreover, attempts were started globally in the early 1970s to apply major developments in applied learning theory, particularly active learning methods, to educational radio for schools, leading to the development of Interactive Radio Instruction (IRI) (Kurrien 2008).

During the 1990s, Indira Gandhi National Open University (IGNOU) started using radio extensively for direct class teaching and for school broadcasting. In 1992, IGNOU collaborated with AIR stations of Mumbai, Hyderabad and Shillong to start broadcast of educational programmes. IGNOU started the Interactive Radio Counselling (IRC) project in 1998. IRC bridged the gap between Institutions and students by instantly responding to their queries and providing academic counselling. 186 stations air the Interactive Radio counselling on every Sunday for one hour (4:00 PM - 5:00 PM). A toll-free telephone facility is available from 80 cities which enables students to talk to experts and clarify their queries. (Vyas, V & Sharma, Ramesh & Kumar, Ashwini, 2002).

In November 2011, IGNOU launched the educational FM channel 'Gyan Vani'. It covers different aspects and levels of education including primary and secondary education, adult education, technical and vocational education, higher education and extension education. The programmes are designed by various educational institutes, NGOs, government and semi-government organisations, UN agencies and ministries. Gyan Vani also covers topics such as women empowerment, consumer rights, human rights, child rights and Adivasi issues. (Roy & Ghosh, 2013). However, All India Radio stopped operation of all 37 stations of Gyan Vani

FM channels from October 1, 2014, due to discontinuation of payments from April 1, 2013 onwards by IGNOU, accumulating outstanding payment of Rs. 21.64 crores (Shashidhar, 2015). It was only in April 2019 that IGNOU reactivated 13 Gyan Vani stations after carrying out the necessary repairs and maintenance works on the aging equipment. (Enarada.com, April, 2019)

The Interactive Radio Instruction (IRI), a low educational technology has shown a very positive impact in developing countries. It is a distance education system that combines radio broadcasts with active learning to improve educational quality and teaching practices. In an IRI classroom, students and teachers can be heard reacting verbally and physically to question and exercises asked by the radio characters and participating in discussions, experiments and other activities as instructed by the radio programmes. The World Bank noted it as a successful experiment in developing countries, declaring, "There is consistent and significant evidence that IRI can increase learning across subject matter, age, gender, and rural or urban location. Students show progressively greater learning with time," (World Bank, 2005). IRI is a teaching methodology that makes learning a fun. Learners sing, ask questions, listen to stories and play games in this method. IRI, which only requires a radio and a facilitator, made education accessible to large number of student community especially in remote areas. IRI consists of 20-30-minute teaching and learning exercises designed for daily classroom activity. The radio lessons are designed around the learning criterion at different levels of science, mathematics, language and other subjects. (Chandra, 2003) Various researches carried out around IRI showed that Mathematics can be effectively taught by radio. The Nicaragua Radio Mathematics Project, funded by United States Agency for International Development (USAID) is a successful example of IRI (lliott, & Lidon,2017). Each mathematics lesson consists of two parts, the broadcast portion and the teacher-directed portion. Students are given a worksheet. The broadcast lesson is turned on. During the broadcast lesson, the radio characters sing, play and talk Mathematics, inviting the students to join. The children can respond orally, physically and in writing. After the broadcast session, the teacher continues the lesson. Students are made to respond in the worksheet provided to them. The worksheets are later collected and sent for evaluation. The study reports revealed that students who were taught through IRI achieved significantly higher scores than those taught through formal classroom interaction. The study also found that radio lessons were particularly effective in raising the level of knowledge of students who knew least. There are many other successful stories of IRI.

Kenya's nationwide weekly radio programmes "Giving birth and caring for your children" combined entertainment, humor and instruction. It was effective in educating the audience about modern child care practices (Hostetler,1976; Jamison & McAnany,1978). The study indicated a general recognition of child care, and most of the community members were able to recall the topics covered by the programme. Pre and post broadcast surveys in civic education project, organised in Botswana by a community college, which provided villagers with basic information about the government and its procedures about citizens' rights and responsibilities, showed a definite increase in people's knowledge and awareness of government (Nwareundu & Thompson, 1987).

In his article "Using Community Radio for Non-formal Education" author Thomas J. (Thomas, 2001) stated that community radio (CR) can be used as an effective medium for education due to its accessibility, availability and affordability. The close- ties with the communities allow community radio stations to know the listener's requirement and give good access to the resource pools. Radio programmes also can use different methods such as radio drama, songs, interview, documentary, panel discussion to educate the people. In India too, community radios, despite the limitations of reach, receivers and quality content as well as that of capacity to teach complex subjects, stations have experimented with broadcasting educational programmes for different sections of societies - students, women, farmers, youth, domestic workers, and factory workers. They broadcast programmes on Math and Science, taught languages like English and Urdu, and worked hard to produce educational content for their listeners. There are many successful stories of community radio's role in education, some of which are mentioned here.

The year 2012 was declared as the Year of Mathematics by the Government of India (Pandit, 2011). As a result, the National Council for Science and Technology Communication (NCSTC), a department of the Government of India, mandated to communicate Science and Technology to masses, stimulate scientific and technological temper and coordinate and orchestrate such efforts throughout the country, collaborated with four community radio stations to pilot a project to teach Mathematics through radio. Mathematics is considered as the language of the universe and its application in daily life made it an important subject for all sections of society. With the programme's huge success, the project was then expanded to 12 CR stations in the first phase and another eight in phase two. With an effort to promote scientific and logical thinking and introduce mathematical concepts in everyday life, 180 programmes were developed by each of the 20 stations. The programme was broadcast every alternate day and was repeated at least twice on other days. The Radio Mathematics Project mainly targeted areas where students have poor access to quality education. The partner stations chose their target audience which varied from pre-primary, primary, secondary and higher education students to factory workers, domestic workers, self-help groups, rag pickers, weavers, farmers, and agriculture labour. The impact was evaluated by a third party and the result was found to be more than satisfactory.

'Science for Women's Health and Nutrition' programme was another landmark in using the radio for educational purposes. The project, once again initiated and supported by the NCSTC, intended to improve health awareness among women as well as that of their families. NCSTC collaborated with 63 community radio stations across the country in four phases for the execution of the project. A total of 365 programmes were produced by each community radio station in one year. The programmes besides promoting healthy eating habits and motivating listeners to lead active lifestyles, disseminated knowledge on health and science. The stations experimented with different formats of programming and included information on the need for a balanced diet, knowledge about nutritious yet inexpensive and locally produced foods, benefits of seasonal fruits and vegetables, healthy cooking styles, recipes, and lifestyle changes that could help women and children reach their full potential. The programmes also emphasised on the need for institutional delivery, pre and post-natal care, importance of immunization, addressing communicable and non-communicable

diseases and more. The programme prioritised issues of tuberculosis, infant mortality rate, mother maternal mortality, low birth weight, communicable/non-communicable diseases, HIV-AIDS and health & sanitation. The effort was to simplify everyday science to ensure a significant and measurable behaviour change in the target groups. As part of the outreach activities cooking competitions, best recipe and quiz competitions, health and nutrition camps, poster competitions etc. were organized on a quarterly basis. Innovative approaches were adopted by the community radio stations to reach out to their audiences and educate them about the need to adopt a scientific approach towards health and nutrition.

Radio Tuition, is one of the most innovative programmes initiated by Radio Mewat, a community radio, licensed to a non-governmental organization, Seeking Modern Applications for Real Transformation (SMART). The idea of this programme was inspired by the abysmal results of the Class X examinations, held by Haryana Board of Secondary Education in 2017. Faring lowest in Haryana were the districts of Mewat and neighbouring Faridabad, where only 4 out of every 10 students passed the examination. The situation was far worse in most of Mewat's government schools where only 1 or 2 students had passed (Kumar, 2017). A survey (unpublished) by, Radio Mewat, was able to uncover the probable reasons behind this which were - non-existent educational infrastructure, unavailability of qualified teachers especially in Mathematics, Science and English, poor sanitation and lack of clean drinking water. The Radio Mewat surveyors found that there were schools that had a teacher-student ratio of 1:300, with no subject teachers- only physical education teachers were present. Moreover, the private schools (with also poor quality of teachers) were expensive and out of reach for majority of Mewatis, whose livelihood depended on agriculture and allied activities. In an attempt to find alternative solutions to these issues, Radio Mewat launched its Free Radio Tuition programme in August 2017. With the stations reach extending to about 170 villages and an active audience of around 28% of the residents within its geography, the radio started a 4 hour 'education only' broadcast every weekend. Teaching-learning modules were developed with the assistance of 'star' (in Mewat qualified and efficient teachers are called Star Teachers) teachers from government and private schools as well as college students. With a mission to cover the entire syllabus of English, Mathematics, Science and Social Studies, the radio started broadcasting the class capsules for Grade 6 to Grade 10. Clarifications were provided over phone. Students started walking into the studio to seek answers to their problems. Seeing the impact and popularity of the programme, the District Elementary Education Officer (DEEO) began promoting the initiative and encouraged the students to listen to Radio Tuition. In 2018 March, the DEEO hosted a meeting with the principals of all government colleges and the team of Radio Mewat. He told the principals to encourage the children to listen to the radio and also asked them to send their 'star' teachers to assist in programme production. The performance of the students of Mewat in the Class X board exams of 2019, is an endorsement of Radio Mewat's efforts. A total of 57.40% students passed the Class X exam and Mewat ranked fifth in Haryana (inputs received from Radio Mewat 90.4). Whereas, in districts that could not benefit from programmes like Radio Tuition, the results continue to be worrisome. (Seth, 2019)

Radio Media Village (RMV) 90.8 FM is the first community radio station in Kottayam district of Kerala. It is run by the prestigious St. Joseph College of Communication (SJCC) which holds a unique reputation of being the first university affiliated media college in South India. RMV broadcasts 17 hours a day, and covers over 80% of the population in the districts of Kottayam, Alappuzha and Pathanamthitta and has an estimated listenership of around 8 lakhs. At any given point of time, there are over 5 lakhs listeners, claims the radio station. Majority of its programmes are on the themes of agriculture, health, education, environment, social welfare, community and cultural development. In 2012, the State Institute for Educational Technology (SIET), Department of Education, Government of Kerala, signed up with Radio Media Village as a partner to broadcast all the educational programmes produced by Vidya Vani FM, of SIET. The programmes reached the most vulnerable communities and impacted the results. This was a huge endorsement of the potential, reach and popularity of the radio station (Inputs received from Radio Media Village 90.8).

Jyotirgamaya 91.2 MHz community radio station, licensed to the Punjab University, in its effort to reach out to the less privileged population, started a new initiative of recording and broadcasting the textbooks for visually impaired students enrolled in the university and living in the neighbourhood. Student volunteers record the text, edit the programmes and then handover the same to the visually impaired students. The effort is to record the entire curriculum for both undergraduate and post graduate courses in both Hindi and English. The content is distributed through pen drives and DVDs as well as broadcast on radio. Though the text books are available in braille, but is not easy to access them and sometimes it is not easy to read them as they become voluminous and are not user friendly. The audio programmes (books) are distributed free of cost to students of government schools and colleges and are much appreciated. Till date 15 textbooks have been converted into audio books and close to 500 hours of radio time have been devoted to this effort (inputs received from Radio Jyotirgamaya 91.2).

These are just a few examples of the role that community radio has played in education.

According to the Dictionary of Education "listening is the art of paying close attention to the conversation of another person or persons in order to obtain selectively verbal and nonverbal clauses to behavioural patterns explicit or implicit." Listening is an important factor in the process of learning. It is an active knowledge guided process. Also, reading is a fairly new skill for humans on the earth, thus the human mind appreciates the spoken words more than letters. Due to the low unit cost, wide popularity and vast coverage, community radio has proved to be an effective educational medium, as it not only speaks but also listens.

Further, radio is also a blind medium that compels its listeners to use their imagination to support the sound message. It has the power to stimulate the abstract thinking of the listener and to enrich his or her power of imagination. It functions in real time; and its codes are purely auditory, consisting as they do of speech, music, sounds, noises and silences (Duby, 1990). Similar to radio programmes, teaching is also basically an oral communication method. Ancient education system mainly depended on listening and speaking. Thus, radio broadcasts not only have the potential to complement teachers in classrooms but, can also be used as their substitutes in their absence. They can promote both -a formal and informal system of learning. Community radio in particular, has the ability to expand the capabilities

of its listeners, add value to what they are doing by delivering content that is useful, need based and makes sense to them. It has the potential to inform, educate and transform their lives.

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General Article

Television: No more an Entertainment Box Only!

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Abstract

Television, introduced in India in 1959, has been taking care of both "instruction" and "social education" in the context of educational broadcast in India. Television is still considered as one of the greatest inventions of mankind among thousands of other technological inventions made so far. It has gained popularity among the millions of people and made a central place in a wide spectrum of media including new media. Apart from being a source of entertainment, it has evolved as one of the medium of educational technology. This article tries to give an overview of Television in India with regard to its educational functions and also as an educational equaliser. An attempt has been made to give a picture of educational broadcast in India with special reference to distance education. Few challenges that emerge while using Television as an educational media alongwith few points of policy implications have also been discussed.

Keywords: Television, educational Television, educational media, SWAYAM Prabha

Introduction

The literal meaning of Television is, "vision at a distance." Nevertheless, it is a composite word derived from the Greek *tele* which means, "at a distance", and the Latin verb *video* which means, "I see". "Television" has also been briefly defined as "vision by telegraphy" (Dinsdale, 2000). The history of origin of Television can be traced back to 26 January 1926, when John Logie Baird gave the world's first demonstration of true television before 50 scientists in central London ("BBC-History-John Logie Baird", n.d.). But, Marconi was the first person who developed wireless transmission and without which invention of television could not have been possible. So, what was the reason behind the invention of 'Television'? Was it for entertaining us? or for some other purpose? Therefore, at the first place, it becomes important to understand the vision behind introducing Television to the masses.

> "When television is good, nothing —not the theatre, not the magazines or newspapers — nothing is better. But when television is bad, nothing is worse. I invite each of you to sit down in front of your own television set when your station goes on the air and stay there, for a day, without a book, without a magazine, without a newspaper, without a profit and loss sheet or a rating book to distract you. Keep your eyes glued to that set until the station signs off. I can assure you that what you will observe is a vast wasteland."-*Newton N. Minow,* Chairman, Federal Communications Commission (FCC)."

Minow in his speech, referred to American commercial television programming as a "vast wasteland" and advocated for 'programming in the public interest', "Television and the Public Interest", popularly known as '*Wasteland Speech*' ("American Rhetoric: Newton Minow-Address to the National Association of Broadcasters (Television and the Public Interest)", n.d.). This landmark speech for the medium of 'Television' was delivered during the convention of the National Association of Broadcasters held on May 9, 1961. It was a time when there were only three networks in the United States. With the advent of large number of private owned television channels, this 'wasteland' increased manifolds. Even after five decades, this speech has its own relevance and consequently, it sets the agenda for all of us to discuss few major issues: Does Television function in the public interest? Does television spoils our children? Has Television made significant contribution so far towards educating the mass?

In India, the prime objective of Television Broadcast was to 'educate' the masses through 'entertainment'. But to our dismay, in due course of time, the 'education' has taken the back seat and the 'entertainment' has tried to overshadow the basic motto of Television in India with one and only objective of generating revenue. However, effort is on towards motivating teachers, students and policy makers to exploit the strength of the television medium for life-long learning.

Educational Media in India

The constitution of India has already guaranteed free and compulsory education for all children as fundamental right irrespective of religion, language, cast and creed. The Right to Education Act, 2010 has been passed in the Indian parliament to this effect. According to this Act, every child in the age group of 6 to 14 years will have a right to free and compulsory education in a nearby school. With this, the role of educational broadcasting on Radio and Television and webcasting on internet has become important in order to reach the unreached. It also intended to cope with pressing educational needs while delivering a high standard of skill-oriented education (Agrawal, 2000). Although, "Democratization of education" is an important issue with regard to the use of educational broadcast but, many researchers claim that limited evidence show that educational broadcasting has really helped in increasing either access or quality of education in India (Agrawal, 2000). Nevertheless, from the very beginning, both "instruction" and "social education" were included in educational broadcast in India.

Television was introduced in India in 1959. Much before Television came into existence in India, Radio was the first electronic medium through which educational broadcasting was also attempted for almost three decades. As Binod Agrawal writes: "The year 1971 marked the beginning of concerted efforts for use of electronic media for improving the quality and reach of education" (Agrawal, 2000). But unfortunately, it was never resolved by the academicians and educational policy makers "whether educational broadcast can be used directly without teacher intervention (Agrawal, 2000)". Despite the fact that some stand-alone educational media (both broadcast and non-broadcast) have been created as private and public initiatives, the use of educational media has not been very impressive so far. We may all agree that such situation ought to happen in the absence of a clear-cut policy or direction.

Television vis-à-vis Idiot Box

Every moment of our life is facilitated by a new invention and the advent of a new technology. Television is still considered as one of the greatest inventions of mankind among thousands of other technological inventions made so far.

The popular connotation of being a distractor to education has been a major hindrance in popularising it as an educational medium. As someone has rightly said that *"if you read too much books you are called good reader but if you watch too much TV you are not called good viewer"* (TV is not an Idiot Box, 2013).

Television in our day to day life

Over the course of time, Television has become an important part of human life. It has been catering to many of the day-to-day needs i.e. for entertainment, political news and for information on consumer goods etc. As Jane Root (Root, 1986)**,** the first woman channel controller of the BBC (British Broadcasting Corporation) describes in 1986: *"television is very effective towards insulating ourselves from other people and their demands. Interestingly, 'it is time for bed' can be easily ignored with the help of a television set"*.

Does Television influence Children?

Television being a broadcaster of various types of information, has been found to influence many of our opinions and choices. But, does Television influences children? As Jane Root writes (Root, 1986): "Claims for the powers of television become particularly exaggerated when the audience is composed of children." Cedric Cullingford (Root, 1986) writes, '*Children can understand the complexity of moral decisions by the age of five…they can talk about the concept of thinking and the meaning of death between five and seven*'. Therefore, TV can be considered to influence anyone's life irrespective of, gender, age, caste, social background etc. But, it is important to note here that is has its own limitations with regard to its access, audience's characteristics and other logistics (Groucho Marx Quotes, 2013).

What is Educational Television?

In the recent year the concept of educational Television has emerged with reference to educational technology. Therefore, it becomes important to understand what is Educational Television? Whether it should be referred to as educational or instructional? Following are some of the meanings of the terminology (Das, 2016):

(i) Programmes under SITE (Satellite Instructional Television Experiment) were classified into two broad categories i.e. (a) Educational Tele Vision (ETV), meant for the school children in the age group of 5-12 years and (b) Instructional Television (ITV) for adult audience, primarily designed for neo-literates and illiterates (SITE, 1981). As far as ETV programmes were concerned, they were meant for making education more interesting, creative, purposive and stimulating as well as for creating awareness in the changing society. Whereas, ITV programmes, primarily meant for adult viewers, were to cover incidents of national importance, improved practices in agriculture, health, hygiene, family planning, nutrition, etc. and some recreation programmes.

(ii) Educational Television is also referred to 'use of television programs in the field of distance education' (Educational Television, n.d.). Indira Gandhi National Open University (IGNOU) stands an example of this. It was established in 1985 by a Special Act of Parliament "to advance and disseminate learning and knowledge by diversity of means, including the use of communication technology, to provide opportunities for higher education to a large segment of the population" (IGNOU, 1985). Along with the rapid expansion, it has emerged as an international institution in the field of open and distance learning. It has adopted an integrated strategy for imparting instruction, consisting of printed materials, audio-video tapes, broadcast on radio, educational TV channels, teleconferencing, video conferencing as also the face- to- face counselling (Das, 2009).

Television (TV) to Educational Television (EDTV)

In 1932, State University of IOWA, USA became the first university to use television as an instructional medium. But, the World War II, slowed down the introduction of television in education. In spite of interest of educationists very few educational institutions got involved in using television as an instructional medium till 1948. Understanding the potential of television for educational purpose, "the Federal Communication commission in USA reserved 242 frequencies for educational broadcast on no profit and non-commercial basis in 1952" (Magnuson, 1965).

Various functions of television in delivering education through distance mode in supporting and enhancing teaching include; instructing; explaining, clarifying; motivating and encouraging; imposing study speed (determining rate of study); presenting a reference to large masses; changing behaviour; and presenting unreachable facts and events, have been presented (Hizal, 1983). After a decade of Hizal's highlighting Television's educational potential, in 1993, a ten-day long first IGNOU-ISRO (Indian Space Research Organisation) teleconferencing experiment was done covering 525 participants. This experiment demonstrated that by using one-way live video (interactive television) with two-way audio, all students could view and interact with the teacher, and simultaneously the teacher could also listen to all participating students through phone at remote sites. It became a major landmark in the extensive and continuous use of teleconferencing for distance education. The success of this experiment prompted the university to include teleconferencing as a regular component of IGNOU's student support system (Khan & Panda, n.d.).

The U.K Open University (UKOU), a pioneer in the field of distance education, has already demonstrated the instructional power of television. Parallel to UKOU, IGNOU has been imparting education through the mode of Open and Distance Learning (ODL) by adopting a multiple media approach: transacting the course material through print, audio (Radio) and video (TV) modes.

From Doordarshan to Gyan Darshan: A Journey of Indian Television

Decades back, Indian viewers were exposed to only few Doordarshan's programmes, which most media analysts considered to be dull, non-commercial in nature and directed towards only education and socio-economic development with very few entertainment programmes. With serials like Hum Log (1984), and mythological dramas like Ramayan (1987-88) and

Mahabharat (1988-89) a big change came in the history of Indian Television which attracted very large number of viewers. The scenario changed further with the up-gradation from black & white to colour TVs, delivery of TV programmes via cable network in smaller towns apart from the metros. This resulted in a sudden increase in the purchase of TV sets (http://www.indiantelevision.com/headlines/y2k12/apr/) and later, launching of various other channels.

Doordarshan, a division of Prasar Bharati, is one of the largest broadcasting organisations in the world in terms of studios and transmitters (Door Darshan, n.d.). It is an Indian public service broadcaster which has started replacing its analogue transmitters to digital transmitters. As a result, it allows up to eight channels to be carried from a single transmitter. Doordarshan has been rendering its services at three levels – national, regional and local. The national level emphasises on events and issues of interest to the entire nation and it includes news, current affairs, documentaries on science, art, culture, environment, social issues, serials, music, dance, drama and feature films. The regional level programmes are beamed on DD National at specific time and also on the Regional Language Satellite Channels. These programmes cater to the interests of a particular region with its native language. Local programmes are area-specific and cover local issues featuring local people.

Doordarshan started as an experimental telecast in Delhi on 15 September, 1959. Nevertheless, the regular daily transmissions started in 1965 along with a five-minute news bulletin as a part of All India Radio. In 1972, the television service was extended to Bombay (now Mumbai) and Amritsar. Television service was made available only at seven Indian cities till 1975. On 1 April 1976, Television services were separated from radio. Finally, in 1982, Doordarshan came into existence as a National Broadcaster with Krishi Darshan as the first telecast program. Till 1982, the transmission was mainly in black & white mode. It was the first turning point in the history of Indian Television when Doordarshan introduced coloured TV during the Asian Games held in New Delhi in 1982 and simultaneously started installing transmitters nationwide for terrestrial broadcasting. It is significant to note that, during that period no private enterprise was allowed to set up TV stations or to transmit TV signals. The second turning point came in the early nineties when foreign channels like CNN, Star TV and domestic channels such as, Zee TV and Sun TV started broadcast of satellite signals (http://www.indiantelevision.com/ Indian broadcast/ history/ historyoftele.htm). In this manner, Television reached people of India through various regional, national and international programmes simultaneously.

Gyan Darshan-A New Face of Indian Television

Television has been perceived as an efficient tool for imparting education to primary, secondary and university level students. Educational broadcasting in India is more than 40 years old and UNESCO has played an important role in promoting use of electronic media for education. Though, educational broadcasting has suffered from a built-in contradiction i.e. whether it should be used to enhance classroom education or be used to enrich the knowledge of the learners (Agrawal, 2005). With the introduction of open and distance education, the educational broadcasting has gained a greater momentum. The potential of electronic media, particularly television, has been recognised because of distance neutrality and simultaneous reach in covering large areas. The National Policy on Education (1986)

gave due emphasis to educational broadcasting in India. Some major educational television projects undertaken in the country in the last three decades (1960-1990) are, Secondary School Television Project (1961), Delhi Agriculture Television (DATV) Project (Krishi Darshan) (1966), Satellite Instructional Television Experiment (SITE) (1975) (SITE, 1981), Indian National Satellite Project (INSAT) (1982) and UGC-Higher Education Television Project (1984).

Gyan Darshan (GD), a 24-hour educational television channel, was launched on January 26, 2000 in India (Agrawal, 2005). It was considered to be a major milestone in the field of educational broadcasting in the country. It came as a joint venture between the Ministry of Human Resource Development (MHRD) and Information and Broadcasting, Prasar Bharati and IGNOU. Gyan Darshan, a fully digital exclusive Educational TV Channel, was a digital bouquet of 4 channels-GD-1 (Prime Channel), GD-2 (Interactive Distance Education Channel), GD-3 (Ekalavya-Technology Education Channel) and GD-4 (Vyas-Higher Education Channel). Nevertheless, due to some financial, administrative and technical reason, it got off-air on June 4, 2014 but, was back on-air on October 4, 2017.

Educational Broadcasts by CIET-NCERT, NIOS & CEC-UGC

Similar to that of IGNOU, the National Institute of Open Schooling (NIOS) takes into consideration learning through printed self-instructional material, audio and video programmes, participating in Personal Contact Programme (PCP), and Tutor Marked Assignments (TMA) (NIOS, 2016). Besides IGNOU and NIOS, there are other educational institutions in India at the national level, committed to enhance learning beyond the classroom using various educational technologies. Central Institute of Educational Technology (CIET) national Council of Educational Research and Training (NCERT) is one of such educational institutes which undertakes activities to widen educational opportunities, promote equity and improve quality of educational processes at school level (CIET, 2016).

Another important player is the Consortium for Educational Communication (CEC). It is one of the Inter University Centres set up by the University Grants Commission (UGC) of India. It has a goal of addressing the needs of Higher Education through the use of powerful medium of Television along with the appropriate use of emerging Information Communication Technology (ICT) ("About CEC Pages - About CEC", 2016). In order to exploit the potential and power of television towards disseminating educational knowledge, UGC started the Countrywide Classroom Programmes in the year 1984. Since 1993, CEC has been working as a nodal agency to coordinate, guide & facilitate production of educational programmes at the National level ("About CEC Pages-About CEC", 2016), by setting up Media Centres at various Universities and spread all over the country.

SWAYAM Prabha

The SWAYAM Prabha is a group of 32 DTH channels devoted to telecasting of high-quality educational programmes on 24X7 basis using the GSAT-15 satellite (SWAYAM PRABHA, n.d,). The contents are provided by NPTEL, IITs, UGC, CEC, IGNOU, NCERT and NIOS. The INFLIBNET (Information and Library Network) Centre maintains the web portal. The DTH Channels covers the following (SWAYAM PRABHA, n.d,): a) Higher Education:

Curriculum-based course (https://www.swayamprabha.gov.in/) contents at post-graduate and under-graduate level covering diverse disciplines such as arts, science, commerce, performing arts, social sciences and humanities, engineering, technology, law, medicine, agriculture, etc. All courses would be certification-ready in their detailed offering through SWAYAM, the platform being developed for offering MOOCs (Massive Open Online) Courses (MOOCs, n.d.) (b) School education (9-12 levels): modules for teacher's training as well as teaching and learning aids for children of India to help them understand the subjects better and also help them in preparing for competitive examinations for admissions to professional degree programmes, (c) Curriculum-based courses that can meet the needs of life-long learners of Indian citizens in India and abroad and d) Assist students (class 11th & 12th) prepare for competitive exams.

Educational Functions of Television

The above discussion on Television shows that it has been considered as a medium of imparting education. Some of the key aspects of Television with regard to its educational functions (Das, 2016) may be highlighted here.

(i) Television and distance education: Television in distance education fulfils the functions such as, supporting and enhancing teaching, instructing, explaining, clarifying, summarising, reinforcement, motivation and encouragement. Use of television has been increasing in developing countries for various reasons and also for distance education. As Saglik and Ozturk (Saglik and Ozturk, 2001) point out,

> "……. In other words, the best technology to provide all individuals equal opportunities is radio-television technology. This is the main reason that television, a more advantageous technological tool than radio with its audio-visual facilities, is being used non-stop and is improving in each project of the Open Education Faculty".

(ii) Television and health education: In India, Television has already been used to educate the masses with regard to HIV/AIDS education in the form of serials, quizzes, advertisements and awareness programmes (Misra, n.d.). It can also be utilized through teleconferencing mode to provide information and counselling to school students to discuss HIV/AIDS issues openly with experts like medical practitioners, social workers and educationists (Das, 2016).

The Spectrum of Research Study on Educational Broadcast in India (1975-2011)

Over a period of 50 years, educational school television broadcasting (1961), countrywide classroom educational television broadcasting (1984), and several other educational television broadcasts have been evaluated by a number of social scientists and other experts in the area of mass communication and educational technology. Some key findings of those studies may be highlighted here (Das, 2016).

a) Evaluation report on Satellite Instructional Television Experiment (SITE) - The SITE programme was launched on 1st August, 1975 as a joint venture of NASA, ISRO and AIR with the objectives of (a) exploring the potential of satellite for nation-wide communication through the medium of TV and (b) broadcasting instruction programmes in the field of agriculture, family planning and education etc. A study, confined to those aspects of the

programmes telecast meant for adults, was conducted. The findings revealed that after the introduction of the SITE programme, about three-fourth of the respondents felt that the development programmes shown were useful and conformed to their local conditions (SITE, 1981).

b) Research report on National Viewership Survey on UGC-CEC Vyas Higher Education Channel Telecast through Cable & Satellite & DD DTH - In the year 2010, a research report was prepared based on the national survey which was conducted by the Educational Multimedia Research Centres of CEC -UGC (VYAS, 2010). The survey aimed to ascertain the viewership of educational programmes shown on Vyas- the Higher Education Channel and to know the usefulness of multimedia inputs in the programmes produced for the same. Based on the feedback of the respondents, the results of the study may be summarised as follows (Das, 2016): (i) 56% of them found the programmes are relevant, (ii) As far as format of the programmes are concerned, 'video lectures' have been rated 'Good' by the majority of the students, (iii) With regard to the 'attention span', most prefer the duration of the programme to be of 30 minutes duration and (iv) In the context of preferential reference, it was noticed that there is a demand for all types of programmes with a variation in terms of preferences: Enrichment programme (23.4%), Syllabus-based question-answer programmes (19.4%), Syllabus-based lecture programmes (16.6%) and utility programmes pertaining to health related issues, career counselling etc. (least preferred).

c) IGNOU EDUSAT, GD (Gyan Darshan) and GV (Gyan Vani) Assessment Study: 2007-08 IGNOU Open and Distance Learning (ODL) Assessment study 2008 IGNOU Study was an end user study to review the effectiveness and sustainability of interactive multimedia learning support system based on teleconferencing utilizing Television, Radio, EDUSAT, Web platforms and Internet facilities (Das, 2016). The key findings of the study based on students 'Feed In' and opinion of other stakeholders were summarized as follows: (Kumar & Rai, 2007).

(i) With regard to IGNOU's slot in Doordarshan, 47 percent students were watching IGNOU slot programmes telecast on Doordarshan Channel I (DD-1) (ii) 93 percent students who watched IGNOU programmes in Doordarshan main channel were comfortable with the language of telecast (iii) 60 percent students who watched IGNOU slot in Doordarshan rated the content quality of programmes telecast as good (iv) More than seven out of ten students said the programmes telecast on IGNOU slot in Doordarshan was useful in learning process and (v) 60 percent students who watched programme telecast on Doordarshan felt it helped them in understanding their programme topics better.

Students who found the IGNOU programmes telecast on Doordarshan were useful, were further probed for the manner in which it helped them in learning process. The responses were as follows (Table.1):

Table 1: How it is useful in learning process

In...	Percentages (%)
Understanding programme content	60
Enhances knowledge of programme	16
Clarification of programme related doubts	10
Doing well in examination	8
Solving programme related problems	6

Response only of those who said it is useful
(**Source**: IGNOU EDUSAT, GD and GV Assessment Study: 2007-08)

Suggestions

A study on the educational aspect of Television and its prospects leads to few suggestions for the policy makers towards an effective use of television for education:

(i) ETRP vs. TRP: It is the era of TRP (Television Rate Points) i.e. the criterion that indicates popularity of a channel or programme (TRP, n.d.). Similar to that of private channels and their programmes a system of ETRP (Educational Television Rating Point) can be introduced which would prove the credibility of a channel (including news and entertainment channels) in terms of its educational functions. (Das, 2016).

(ii) Cross-channel broadcast: Another point of suggestion is that education needs to be a common agenda across the channels, private or public. Every channel should make a policy of dedicating a slot on their channel to broadcast an educational programme (Das, 2016). If the channel cannot produce, a programme of Gyan Darshan/SWAYAM PRABHA channels on a specific time may be relayed by them. Gyan Darshan/SWAYAM PRABHA Channels may reciprocate by carrying an educational programme (at least an enrichment programme on 'Voting Rights' and 'Protection of Environment' etc.) on its channel free of cost with a gesture to an education-friendly channel (who supports the cause of education) as a policy of cross channel broadcast.

(iii) Using Television for self-learning: The discovery of Hole-in-the-Wall in 1999 by Dr. Sugata Mitra, Chief Scientist at NIIT (National Institute of Information Technology) was an eye opener event in the field of learning skills with some minimal (human) guidance (Hole in the Wall, 2015) The experiment implies that many a times, little or no inputs from teachers is required and children learn things on their own with the process of exploration, discovery and peer coaching. This also points out to a broader concept of Minimally Invasive Education. It is defined as "a pedagogic method that uses the learning environment to generate an adequate level of motivation to induce learning in groups of children, with minimal, or no, intervention by a teacher (MIE, 2015)". Taking these concepts as examples, an interactive television may be put up in public places to educate the masses particularly, children.

Conclusion

Television (TV) has truly emerged as an important medium to disseminate information to the students in various academic disciplines. Over the years, it has been able to break the myth of

being only an entertainer. Though it is yet to understand upto what extent the Educational Television (EDTV) would help to demonstrate itself as an 'Educational Equaliser'. But, the reach and potential it has, requires to be understood in order to serve the educational needs of the young audience.

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General Article

Use of Free and Open Source Software (FOSS) in content creation

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Abstract

Information and communication Technology (ICT) has become a powerful tool and medium for anyone to use, explore and get benefitted from. It provides immense opportunities for teachers, students and the field of education to use the available digital resources for teaching and learning. It also opens up a window for using the ICT to create and contribute the educational resources for the masses. Browsing through Google for searching any content is familiar to everyone today but awareness towards creating educational content/ resource is limited. Free and Open Source Software (FOSS) gives a platform to explore the software/ tools and use them for various purposes. It allows for active engagement of teaching learning fraternity. FOSS provides the freedom to use and make changes to the software itself by making required changes in the source code. This paper deals with the understanding of the FOSS, uses of FOSS for education and understanding of some of the tools available for content creation.

Keywords: ICT, FOSS, education, technology in education

Introduction

ICT is the acronym for Information and Communication Technology, and it is considered as an extension of IT but it is broader than that. ICT as explained by Technopedia is the convergence of various technologies like audio-visual, telephone and computer networks. The meaning of ICT gets complete when this convergence is used to create, store, manage and disseminate or communicate information. If any of the step is not possible in the medium then it may not be considered as ICT. It has been observed that the technologies are being used for communication and information sharing and individuals are more towards being the consumers of information or educational content available through different mediums. Very few have initiated themselves towards the content creation exploiting the available ICT.

The ultimate aim is to bring quality in education and ICT can play a vital role in achieving so. According to National Policy on ICT in School Education:

'ICT enabled teaching-learning encompasses a variety of techniques, tools, content and resources aimed at improving the quality and efficiency of the teaching-learning process'

This gives an idea about the need of ICT in education, which makes it important to understand the way ICT can be utilised to fufill the given need. Teachers and students have already started using ICT in personal lives through their phones and laptops but ICT in education has still not taken front seat in India. Use of various resources available on Internet

has increased but initiative towards creating resources by teachers and teacher educators is still not visible.

It is observed that lack of awareness amongst teachers and students about the ways of creating resources is the main concern. Further the options available for creating resources seem to be complex as well as costly i.e. audio video production is a very complex, costly and tedious job. This needs professional expertise and equipment and it is difficult for a teacher to enter in the world of production. On the contrary practical situations show the ability of a teacher to handle a smart phone and create a video or capture an image, store it on the device and share it further. There seems a gap between the availability of the tools for creating educational resources and knowledge about those tools to the teachers. Free and Open Source Software (FOSS) is one such movement to give varied range of software in the hands of teachers to use.

What is FOSS

Initially during the evolution of computers, software was taken only as an add- on to the hardware and software was shared frequently by the developer. Later certain restrictions were imposed by the developers or the vendors using software licences on the use of software or on sharing the software. Richard Stallman saw this imposition of restrictions on the use of software and established Free Software Foundation (FSF) in 1985 and introduced the term Free Software (GNU Operating System). The Open source Initiative and Free Software Movement are two different movements. Each of them has a specific philosophy (Rao, S.C). Free and Open Source Software (FOSS) is an umbrella term which covers both Free Software as well as Open Source Software.

FOSS Culture

FOSS culture is all about sharing, whatever backend is used for creating is shared, and not just the outcome; the whole process or the recipe is shared. Free Software Foundation (FSF) explains the basic philosophical difference between the Free Software and Open Source software.

Free Software is a social movement and focuses on the freedom of the user without the constraints of copyright and not on being without any cost (Wong & Sayo 2004). "What is Free Software, 2019" says that "the users have the freedom to run, copy, distribute, study, change and improve the software." Free softwares are seen licensed with GNU General Public License (GPL) (Scacchi 2007).

On the otherhand, Open Source Software is a practical developmental methodology in terms of making the software better (Wong & Sayo 2004). OSS may or may not use GPL and adopt some other license allowing for the integration of other software which may not be free software (Scacchi 2007).

FOSS refers to software that is both free and as defined by FSF and Open Source as per the advocacy of OSI (Khan & Rehman 2012). FOSS allows the users and programmers to access, edit/modify or reuse the source code of the programme for improving it further.

In contrast, the proprietary software available in the market for use do not give any liberty to see the source code of the same (Technopedia) and thus, prevent any useful change in the software.

According to FSF a program is free software, when its users have these four freedoms:

- *The freedom to run the program as you wish, for any purpose (freedom 0).*

- *The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.*

- *The freedom to redistribute copies so you can help others (freedom 2).*

- *The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.*

(According to GNU Operating System, 2019)

It might be difficult for a subject teacher to make changes in the source code but a simple step a teacher can take is to start using those softwares and distributing copies of it to students and co-teachers for its maximum use and gather user's feedback which can later help developers to improve upon the software. FSF provides a list of software which can be used in place of the proprietary software. In this paper some software/ tools which are Free and Open Source have been discussed which are helpful to teachers in creation of educational resources.

FOSS Tools

According to GNU Operating System, 2018" A teacher has multiple tasks at his/her disposal and teaching -learning is one major result-oriented task. A teacher uses variety of available resources for teaching-learning, some of those resources are created by others and sometime created by the teacher herself in hard forms and cannot be used during the coming years. FOSS opens a new window for teachers to create resources using easily available technology and with least infrastructure required.

Today Windows is the most known Operating System (OS) to work upon with other added applications and software like Microsoft Office Suite and many more. FOSS gives a possibility to shift to a Linux based operating system which is simple to use and it has its own software store from where one can just install the required software. As a user, only a machine is required and then one can directly install any one Linux based OS like Ubuntu, Debian, Fedora, Mint etc (Opensource.com). Further, there are many tools to communicate with each other which are either Proprietary or FOSS. It is important to be familiar with the open source tools also. Starting from the browser, Mozilla Firefox which is an open source browser for accessing the internet.

Similarly, FOSS has many tools available for variety of resource creation (opensource.com, 2016). Whether one wants to create a simple text document, edit an image, create an audio,

video resource or animate stories, there is a tool. But it is important to get familiarise with these tools and their usages.

Working on Office Suites: Everyone has the need of an office suite having possibility of creating text document, spreadsheet or a presentation. Libre office is one such suite offered as FOSS. Libre Office has six programs that provide everything needed from an office suite:

- Writer for creating word files

- Calc for creating spreadsheets

- Impress for presentations

- Draw for vector graphics

- Math for mathematical formulae

- Base for databases

Libre office can save and open many different formats, including Microsoft file types like DOC, DOCX, PPT, PPTX, xls etc. It is ideal while working with users of various other Office suites, or if one has recently shifted to LibreOffice.

Note taking: Notepad is considered an effective medium for taking notes but there is a possibility that notepad is either lost or not located at the time of need, here software can be of great help. Anything once typed into the soft copy is easy to locate even if the file has not been saved properly. Note taking apps automatically generates a date and time stamp and one can easily locate it and use it further. Some of the tools available under FOSS are Tomboy notes, Red notebook. These note taking tools allows to take notes, close them without saving, retrieve it easily later and also to compile the similar notes together as a notebook and share it as an html file with others.

Mind Map: A mind map can also be utilised for planning and creating the resources. It is a visual tool and gives a platform to link ideas in multiple ways. It allows to think in a divergent way rather just linearly. There are many FOSS tools available to create a variety of mind map having different features. Some of the very simple tools are Free mind, Free plane, Xmind for creating branches and having explanation. An advanced software is VUE for creating mind maps with relation names.

Image and Graphics: The mobile phone or smartphone is a technology which is easily available to masses in comparison to any other such technology which have evolved in recent times. The mobile phone allows to click images, record audio, record video and store it in device. If a teacher needs to create an image resource, it can be done using mobile phone and the same can further be modified using variety of tools. My Paint is a tool which is simple and allows for creating expressive drawing and illustrations.

For image manipulation, GIMP is a useful program; it allows for basic graphic creation, and illustration. Anyone can start using GIMP by doing simple tasks like cropping and resizing images. After the basic familiarity, other functionalities of the tool can be explored. The output image/ graphic can be exported into different file formats. Similarly, there is one tool

which is vector-based graphic design with many features. It can be used for creating simple graphics, diagrams, layouts, or icon art. Pencil and Krita are some more tools which can be used for creating and editing images or graphics.

There are variety of other resources like newsletter, books magazines or any other print material which can be created using Scribus. Scribus is a powerful tool for page layout and publishing.

Music and Audio Editing: For creating audio resources first script need to be written then it can be recorded using mobile phone or Audacity software. Audacity is a simple sound recording and editing software which is available under FOSS. It allows for adding music file, sound effect file parallel to the audio file and apply variety of effects available in the software.

Video Editing: Video resources can be created using Openshot Video Editor. It is a basic video editing tool and allows for chopping of the video, adding simple visual effects and also adding audio layer and finally preparing an MP4 for using and sharing at any and every place. There are other FOSS tools also for video editing like Pitivi and Shotcut.

2D and 3D Animations: Synfig Studio, Krita, Scratch are tools for 2D animations. Synfig Studio is a 2D animation suite which is vector-based. It supports bitmap artwork and is tablet-friendly. For creating 3D models and resources Blender is a powerful open source suite. It includes tools for modelling, sculpting, rigging, animation, rendering, realistic materials, game creation, and simulation compositing, and video editing.

Interactives: H5P (HTML 5 Package) is an online platform for creating, sharing and reusing variety of interactive resources. It allows to create interactive videos, presentations, quizzes, hotspots many more and a mix of all. The resources can be used while teaching-learning and assessment and evaluation. It works through a web-based content editor and allows to add and replace multimedia files and textual content in all kinds of H5P content types.

Apart from this many more varieties of resources like Simulation, animation, Web Blogs, Websites can be created using various tools lika Easy java simulation, Easel.ly, Blogspot, Wordpress and many more.

Subject Specific Tools

FOSS provides an array of software for dealing with different subjects. Mathematics is considered a drysubjects by students but some tools for mathematics can make it very interesting and interactive. Geogebra, Tuxmath, Matlab, Matita which can make mathematics interesting and engaging for the students. These tools are easily available online for download or working online and creating new resources. These can be explored just by searching their names.

Language teachers and students can use Audacity for pronunciation, praat, openculture etc for other language related learnings.

Stellarium, Kalzium, Phet Simulations, Avogadro all these tools can be explored for sciences, Phet Simulations can be used for mathematics social sciences and languages also.

Marble, School Bhuvan, Mapbender are tools for helping students to understand and engross in Social sciences. Apart from these, timelines can also be used in history for understanding the subject in more engaging way.

The approach should be to start exploring the newly available technologies. FOSS tools specifically come with help tutorials which are available online as well as offline through help buttons. Only need is to explore and learn and go beyond the traditional way of working, teaching and learning.

Management and Pooling of Resources: Once resources are created they need to be managed well and shared with public for use. Managing of the resources include giving proper information about the resources which is termed as metadata. Metadata includes title, description, keywords/tags, file name, and mapping the resource with the concept it covers. Then it can be uploaded or pooled on common platform like NROER or on other such online platforms for further access and sharing.

Conclusion

A teacher or a learner has to start using the tools then only the potential of these tools can be judged. These tools are available with a lot of freedom for using as well as sharing. According to UNESCO "The Free and Open Source Software (FOSS) model provides interesting tools and processes with which women and men can create, exchange, share and exploit software and knowledge efficiently and effectively. FOSS can play an important role as a practical instrument for development as its free and open aspirations make it a natural component of development efforts in the context of the Millennium Development Goals (MDGs)." Time is the most required thing to be spend for engaging in new tools, or ideas. A teacher feels overwhelmed when a child learns and achieve something. FOSS provides a complete panorama for exploration and learning and it is high time now to engage with and create contents using FOSS.

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Book Review

Social Media Wellness: Helping Tweens and Teens Thrive in an Unbalanced Digital World by Ana Homayoun

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The book 'Social Media Wellness: Helping Tweens and Teens Thrive in an Unbalanced Digital World' by Ana Homayoun is very relevant and much-needed text in the present time. The book, which largely stems from the author's personal experiences and long career as a counsellor, touches upon a subject which has been an issue for every teen and tween, who is using a smartphone or spending long hours at surfing internet. Perhaps, it won't be an exaggeration that the subject of the book is an issue for almost every smartphone user (*I myself downloaded a few apps after reading the book to review my own smartphone usage and I did find things to feel concern about.*). The book is largely written with a background where (smart) mobile devices find space in the day to day work plan of the tweens, teen and schools and discusses the mental wellbeing of the mobile phone users largely in relation to the social networking applications. The book further highlights that how over-reliance of the school on the digital devices and infrastructure further problematizes the issue. Another important aspect of the book is that it beautifully highlights how the digital world, particularly the social networking sites, affect our day to day life, work efficiency and adds to our anxieties and insecurities. In terms of the design of the book, the book is divided into 8 chapters with first 3 chapters (page 1-80) being dedicated towards building an understanding of the subject while the rest of the chapters (page 81-186) are dedicated towards providing exercises and strategies which can be used to manage the social media wellness in different circumstances. Further, the book is very much reader friendly and it largely appears as a self-help tool for schools, and children to assess their actions which are adding the problem of digital device addictions. In addition, book also provides tips to parents, school and teachers to surmount this over-dependence on the digital infrastructure, to improve the mental well-being as well as the work planning. Considering the manner in which the exercises and self-help tips are given in the book, the book seems to be a must read for those who want to help anyone with the social media addiction. However, at the same time, despite so many positives, the book should be dealt with a caution because the author herself writes that "*the strategies in this book may have little to no immediate effect when a student is struggling with a serious technology addition* (page 99)". Although, the author provides a checklist to understand the severity of the addiction (page 173) but considering the psychological nature of the issue it becomes important to embrace the limitation of the book.

Although, even with the supposed limitation emerging due to the nature of the book as a self-help tool or being based exclusively on author's personal experiences and hence lacking the academic rigor of presenting the entire sweep of scholarship in the field, the book is an important read not just for that part of the world having large technology dependence but even for developing nations like India. The book calls for a preparedness keeping the Indian education system and conditions in mind. The need for digital technologies is very well

highlighted in the NCF 2005. However, it is conspicuous by the absence of any reflection on the safety of children while accessing these technologies. The book under review may perhaps give a clue to the policy makers to fill this important gap. The quest for reducing the bag weight of children (Dutta, 2019) and known attempts of Indian government to introduce smart devices for students (Mea.gov.in, 2019), one can clearly see etching of our future. In addition, when we consider the upcoming market of e-learning platforms in India (Christopher, 2019), and the numbers of e-learning platforms both private (Jain, 2019) as well as government (mhrd.gov.in, 2019) which have emerged recently, the book does ring a bell for the policy makers. Moreover, the falling price of smartphones and increased access for inexpensive (*almost free*) and fast data connection will only add to the problem the book has highlighted and positioned to deal with (Mandavia, 2019 and Economic Times, 2019). Besides, the book also points at the policy of having online portals as an alternate to regular education and demands to have appropriate measures in place to deal with such issues emerging from the over-usage of the digital infrastructure. To conclude, it can be said that despite being written as a self-help book for parents, school and children, it does leave a lot for policy makers and teachers in those countries where digital infrastructure is still making its space. The book gives a very subtle warning to have a system in place to deal with the issues which have emanated due to the excess use of the digital infrastructure in developed countries and pleads us to be cautious enough towards the metal well-being of our Gen-Next.

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Recently High Court and then Supreme court of India banned an app due to its bad effect on children, which quite prove the relevance of the book even in Indian circumstances.; Read the report about the app here Mandavia, Megha. 2019. "TikTok: SC Stay on Ban, Government Asks Apple & Google to Take down TikTok App." *The Economic Times*, 2019. https://economictimes.indiatimes.com/tech/software/no-sc-stay-on-ban-government-asks-apple-google-to-take-down-tiktok-app/articleshow/68898483.cms.

Conference Proceedings

Proceedings of two - days National Workshop

on

Basics of e-content and e-learning through Massive Open Online Courses (MOOCs) - 3rd & 4th December 2018 (Monday & Tuesday)

(Sangeeta Solanki, Assistant Professor, Institute of Professional Excellence and Management (IPEM) and Workshop Coordinator, Email: drsangeetasolanki4@gmail.com, dr.sangeeta.solanki@ipemgzb.ac.in)

Aiming to provide an intense training on e-content, a two days National Workshop on 'Basics of e-content and e-learning through Massive Open Online Courses (MOOCs)' was recently organized by the Centre for Teacher Education of Institute of Professional Excellence and Management (IPEM) Group of Institutions, Ghaziabad on 3rd and 4th December, 2018. The objective of the workshop was to enable the professionals to get basic information on E-learning, electronic content creation, to gain the practical insights into the E-Content and MOOC development and delivery. The workshop was inaugurated by Dr. Nisha Singh, Deputy Director, Inter University Consortium, IGNOU, New Delhi and Dr. Yashpal Sharma, Assistant Professor, Central Institute of Education Technology, NCERT, New Delhi, Dr. A. B. Bhatnagar, Former Head, Department of Education, NREC College Khurja, Dr. Anupam Goel (Secretary, IPEM), Col. (Dr.) A.S. Malhotra, (Director General, IPEM), Ms. Sugandha Goel (Dean Academic, IPEM) and Dr. Nishi Sharma (Principal, Centre for Teacher Education) and Workshop coordinator Dr. Sangeeta Solanki. There were approximately 40 participants representing various reputed Teacher training institutes, renowned Public schools, Research Scholars from Delhi and NCR region. There were three technical working sessions on each day. The workshop provided an extensive hands-on training to the participants on creating e-content, e-learning and Learning Management System including online real time evaluation strategies. It was really a successful workshop catering to the needs of the professionals in the field of education.

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