EMPOWERING SCHOOL TEACHERS FOR EMERGING TECHNOLOGIES: AN ACTION PLAN

By

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ABSTRACT

"Possessing openness to emerging technologies is critical for teachers in the technology-rich 21st Century as technology continues to accelerate at a rapid rate. Readiness for new technologies is a challenge associated with change. Teachers who resist change may impede and/or limit their students' learning and skills. Teachers, therefore, must prepare students by teaching knowledge and skills necessary for students to be successful in the technology-rich 21st Century" (Niles, 2007, p.27). In this context, school teachers need to understand how emerging technologies work, what they offer, and to use them for betterment of teaching learning process. Here a pertinent question arises that what approach should be adopted to empower school teachers for emerging technologies. To critically and systematically deal with these issues, author talks about emerging technologies in education, their impact on teaching-learning process and need for Tech-savvy teachers. This discussion is followed by a detailed action plan to empower school teachers for emerging technologies. The proposed action plan is based on the approach that three parties namely NCTE (National Council for Teacher Education), Teacher Education Departments/Institutions and school teachers themselves are key to fulfill this promise.

Keywords: Emerging Technologies, School Teachers, Technologies for Teachers, Technologies for Teaching Learning.

INTRODUCTION

Background

Technology has caused a revolution in the way we teach and learn but there can be no real revolution unless the faculty changes how they teach (Zemsky and Massey, 2004). Similarly, Geser and Olesch (2000, p. 315) suggests, "What we need is a renaissance of the teacher, a teacher who is fit for working in a networked learning environment and ready to be the guide on the side instead of the sage on stage." In other side, the nature of 21st century learner has changed. The 'new learner' is a 'digital native', a 20-something, who takes to technology as a fish to water. This is in contrast to the 'digital migrant', the adult who has adopted technology relatively later in the life (Kanwar, 2008).

Prensky (2007) observes, "In general, students are learning, adopting, and using technology at a much more rapid pace than their teachers, and many teachers are highly fearful of the technologies that the students take for granted (p.40)……. The fact is that today's students know more – and will always know more – than their teachers about technology and how to manipulate it"(p.42). Prensky (2007, p.42) further offers word of advice, "Teachers can and should be able to understand and teach where and how new technologies can add value in learning. To do this, teachers must learn what these technologies are and can do, and understand them, but without necessarily becoming proficient in their use." These perspectives clearly suggest that school teachers must adapt, learn and use emerging technologies for betterment of teaching learning process.

Emerging Technologies: Educational Relevance

The new technologies have already changed our lives and now changing the world of education. In the past five to ten years, we have seen the appearance of scores of new technologies that have strong potential uses in education. They include email, search, texting and instant messaging, blogs, wikis, podcasting, polling devices, peer-to-peer (P2P), complex computer and video games, networking, augmented reality, social and community building tools,

digital cameras/videocams, phone-based cameras/ videocams, GPS, speed enhancers, interactive whiteboards, DVDs, wireless technologies, mobile learning, wireless technologies, skype, moodle and instant Messaging (Prensky, 2005). These prominent new or emerging technologies are destined to have potential impact on teaching learning scenario in coming years.

Trapping the potential of emerging technologies for betterment of teaching learning process is a challenge that required to be met effectively and efficiently by educational sector as stated by Daanen and Facer (2007, p.04), "If educators are to shape the future of education (and not have it shaped for them by external technical developments) it is crucial that we engage with developments in digital technologies at the earliest stages. We need to understand what may be emerging, explore its implications for education, and understand how best we might harness these changes."

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Present Educational Scenario: Key Emerging Technologies

An emerging technology is one that, as it's maturing, is redesigning the educational process. Emerging technologies such as Skype, Podcasting with Digital Audio Recording, Moodle (a course management system), Wikis (collaborative encyclopedias), and Blogs are redefining the way teacher teach and students learn. These technologies are changing the traditional school environment into one of excitement and cooperative learning. With these emerging technologies, the teacher is no longer the sole dispenser of knowledge. The teacher instead takes the role of guide and coach (Schuemann, 2008). But before discussing further on this issue, let us discuss about prominent emerging technologies and their potential impact on teaching learning scenario in coming years.

Mobile Learning

Mobile Learning or m-Learning is defined as "using mobile technologies, including mobile phones and hand held devices to enhance the learning process." As "mobile" implies that the technology is wirelessly connected, this means that learners are not restricted to one learning environment and m-Learning allows them to access information anywhere and at anytime. Horizon Report (2008, p.17) states, " Mobiles now keep us in touch in almost all the ways that laptops used to: with email, web browsing, photos and videos, documents, searching and shopping—all available anywhere without the need to find a hotspot or a power outlet."

The fact that many students already own and carry mobiles remains a key factor in their potential for education. Added to that is the tremendous pace of innovation in this sector, where intense competition is driving continual advancements (Horizon Report, 2008). The Report further elaborates that students doing fieldwork are using mobiles to take notes and photographs and send them directly to a course blog, where they receive instructor feedback; colleagues using virtual collaboration tools have access to materials while traveling or otherwise away from their computers. Academics are now beginning to acknowledge the importance of m-Learning. For example, the "new generation" of young individuals or the present and future participants of e-Learning interventions has been described as 'always on, one handed texting, instant messaging, and multi-tasking.

Wireless Technologies

The term, "wireless technologies" by its very terminology, is self explanatory and can be linked to m-Learning to some extent. Wireless technology allows the learner to access information at their convenience. An example of wireless technology is iBurst, which offers wireless broadband internet that allows learners to access the internet at any location. Technologies like 'iBurst allows cheap telephone

calls over the internet, and as speeds increase, will be able to handle 'video-on-demand'.

This technology makes it possible for learner to access almost any internet content and supports them to learn at their own pace and in an environment that suits them. In this way, iBurst represents an inexpensive and effective learning tool that allows teachers to manage their students more effectively; to have more control over course content and communicate with colleagues easily.

Skype

'Skype' is a software that allows one to talk to people over the computer. With a fast connection, Skype allows one to talk to up to five people over the computer for free. If one has a good internet connection (e.g. broadband), he/she can talk to anyone in the world and the reception, based on digital technology, is crystal clear. To use this service, users are required to have an internet connection, have downloaded the program and have a microphone and headset.

Skype is quite helpful for language teachers. By using this technology, they can connect their language classrooms to a world of language speakers. It offers good opportunity for teachers to connect a language class to a group of foreign language speaking students. There are even sites, such as the Mixxer dedicated to cross-cultural language exchange. Skype is the best way for students to practice communication of a new language. This way, the students can interact with their teacher and other students who speak the language they are learning.

Podcasting

Podcasting is the method of distributing multimedia files, such as audio programs or music videos, over the internet for playback on mobile devices and personal computers. Podcasts are digital recordings stored in a music file which can then be uploaded to a computer. From this point, much like any file published on the internet, the file can be downloaded to one's own personal media player. The media player can be personal computer, iPod, MP3 player, and even mobile phone. For using podacast technology, one needs the correct (and free) software such as iTunes for Mac or Windows, or Juice for Mac, Windows, or Linux.

The options for using Podcasting as a teaching resource are beyond imagination. Teachers can create their own podcasts using free audio recording software like Audacity or they can refer students to podcasts that are related to the subject they are teaching as supportive information. The Education Podcast Network allows teachers to connect and collaborate via a podcast. They can view podcasts created by academics within their field of expertise, and are also given the opportunity to produce their own programs. In this way, podcasting enables the participating teachers to 'share their knowledge, insights, and passions for teaching. Furthermore, podcasting has the functional capacity to assist students' learning. For example, podcasting not only provides teachers with the flexibility to post important segments of their lectures online, or their interviews with experts, but also allow students to view and create their own podcasts on material covered in class, or in their textbooks.

Wikis

Wiki is sometimes interpreted as the acronym for "what I know, is," which describes the knowledge contribution, storage and exchange up to some point. The name is based on the Hawaiian term wiki, meaning "quick," "fast" or "to hasten." A wiki is a group of web pages that allows users to add content, as on an Internet forum, and also allows others (often completely unrestricted) to edit the content. The wiki is a simpler process of creating HTML pages, and provides tools by which individuals can discuss wiki content and alterations. Content displayed on a wiki can be constantly modified, with changes being recorded as the content is updated. By keeping records of all modifications, wiki creators may at anytime change the content and/or the site's functionality to its previous state.

As wiki functions with the intent of sharing and exchanging knowledge it can be used to support the collaboration of learners. In this way, learners can develop a more comprehensive understanding of all the issues in question. Learners can feel empowered by having the opportunity to build on their knowledge and can subsequently derive a sense of involvement. Group interaction is also promoted as there are set of documents that reflect the shared ideas of the learning group. Wikis allow for student collaboration

and are relatively easy to use and access. Wikis can be used as a general source for class materials and for class communication. Teachers can also posts class assignments to a wiki and students can create a portfolio for their peers to review. Other examples of wikis that are used in the e-learning context include, "EdTechPost Resources" which comprises of metadata, simulations, games, and open source content systems and "WikiSpaces" which is a space for teachers.

Weblogs

A weblog is a website where entries are commonly displayed with possibility to maintain, add or edit content on regular basis. A typical weblog combines text, images, and links to other blogs, web pages, and other media related to its topic. The ability for readers to leave comments in an interactive format is an important part of many weblogs. Most weblogs are primarily textual, although some focus on art (artlog), photographs (photoblog), sketchblog, videos (vlog), music (MP3 blog), audio (podcasting) and are part of a wider network of social media. Micro-blogging is another type of blogging which consists of weblogs with very short posts.

Weblogs allow teachers to communicate with students and parents as they can log daily class activities. The teachers and learners can easily create their weblogs to disseminate and share ideas, study material, research work/findings or their views on different educational aspects. They can regularly edit their postings on their weblogs and use weblogs to universalize their ideas and achievement for academic world and community. Teachers can also use weblogs as portals to list homework assignments, classroom procedures, and class work. Students can use the weblog to post their own work and have it commented by their teachers and classmates.

Moodle

Moodle is a virtual learning environment. It is an online space designed to mimick the classroom experience. Moodle is like a virtual classroom and Moodle homepage behaves just like a website does. The downside to Moodle is that it must be hosted by an outside source and is not free. A Moodle homepage (or class website) looks and acts just like a website. There are links to the course calendar, online syllabus, weekly topics, assignment descriptions, discussion forums and so on. Students are able to jump around from one week to the next so they will always be able to find information they may have missed.

Moodle is especially useful for a teacher because she/he can create links to resources for students, create and assess quizzes, and has control over the entire site. Therefore, the teacher can monitor student activity, add/delete any of the content, keep track of grades, which can be either accessed or hidden from student view. Teachers can post links to the class calendar, links to assignments that need to be completed, an online syllabus, and discussion forums. This gives students the ability to find information they may have missed because they were absent from class. Teachers can also create and give tests, monitor students' activity, edit content and organize grades. Moodle helps teacher to keep total control of the learning environment. Moodle also allows for a class forum where topics relevant to course can be discussed. A great benefit of having a class forum is that students are given the freedom to gather their thoughts and express themselves without the pressures felt in classroom discussions.

Instant Messaging (IM)

Instant Messaging (IM) is a tool that successfully supports informal communication. A form of IM is SMS technology. IM is a synchronous learning tool which in an e-learning context can provide the student with real time and instant learning opportunities. IM, as a real-time communication tool can be utilized as a delivery option for hearing-impaired students. This allows them to access teachers without a third party to interpret. Learners can also use this to get automated feedback from assignments or questions, freeing the tutor from any additional workload.

IM in its SMS form has proved to be extremely effective amongst a group of hearing impaired students. With the assistance of IM technology, these students were able to communicate in real time and use this medium as a tool to facilitate communication with their teachers without the support of an interpreter. The most common use of IM within an e-learning context has been to produce a cooperative learning environment. Users of IM are said to be able to

articulate ideas, issues and opinions in real time. As such, IM can be used to engage and maintain learner interest as correspondence occurs in a timely manner. Although some people may become confused by chat dialogue or the functionality of chat room discussion, it would appear that the positive facets of IM far outweigh this limitation (Hsieh and Hsu, 2008).

Using Emerging Technologies: Desired Teaching Competencies

The above discussed emerging technologies are quite helpful for teachers to foster a learning environment of excitement and interactivity. But using these technologies to keep students motivated and interested in contributing to the class is not an easy task, as observed by Prensky (2007, p.40), "The twenty-first century will be characterized by enormous, exponential technological change. Our so called 'Digital Native' generation (that is, our students) is already embracing these changes, creating in the process an 'emerging online digital life." Similarly Meleises (2008. p.01) suggests, "Success in the use of ICT in education depends largely on teachers and their level of skill in integrating ICT into the teaching process and in utilizing ICT to provide learner-centered, interactive education."

The use of emerging technologies by teachers demands a number of changes that include approaches to teaching and learning, teaching and learning styles and behaviour, and contexts in which teaching and learning take place. School teachers are required to move away from teacher-centered instruction to group work and student-centered learning for effective utilization of emerging technologies. But making these changes happen in teaching fraternity is not an easy task. Teachers are required to work at three levels to make these changes happen. These levels are Mental level (making attitudinal change to accept technologies), Physical Level (acquisition of skills to use technologies) and Social Level (learning with peers and students to promote technologies). Follow-up of these levels will certainly help teachers to change minds, to improve teaching learning process and to serve a changing society.

Besides making attitudinal and social changes, school teachers will be further required to master a new set of teaching competencies referred as 'e-Teaching Competencies' (the term 'e' denotes technologies). The reason behind propagation of a new set of teaching competencies is that traditional teaching competencies alone are not sufficient to fulfill the demands of technology assisted teaching learning process. One can hope that mastery of 'e-Teaching Competencies' that are discussed below in Table 1 will help teachers to make effective utilization and take maximum benefits of emerging technologies for educational cause.

Making School Teachers Competent for Emerging Technologies: An Action Plan

Niles (2007, p.27) observes, "Possessing openness to emerging technologies is critical for teachers in the technology-rich 21st Century as technology continues to accelerate at a rapid rate. Readiness for new technologies is a challenge associated with change. Teachers who resist change may impede and/or limit their students' learning and skills. Teachers, therefore, must prepare students by teaching knowledge and skills necessary for students to be

Area of Competence	Desired Competencies for School Teachers
Emerging Technologies based Operations and Concepts	Have knowledge, skills, and understanding of concepts related to emerging technologies
	Have updated technology knowledge and skills
	Stay abreast of recurrent and emerging technologies
Emerging Technologies supported Learning Environments	Develop appropriate technology supported learning opportunities
	Apply technology-supported instructional strategies
	Create stimulating learning environment to arouse learners by using technologies
Emerging Technologies mediated Teaching and Curriculum	Use technology to support learner-centered teaching
	Apply technology to develop learners' higher-order skills and creativity
	Manage student learning activities in a technology-enhanced environment
Emerging Technologies enabled Assessment and Evaluation	Apply technology in assessing student learning
	Use technology resources to collect and analyze data
	Evaluate students' use of technology resources for learning
Emerging Technologies enhanced Professional Development	Use technology resources for their professional development
	Apply technology resources to learn new tricks of the trade
	Use technology to communicate and collaborate with peers, students, and community
Emerging Technologies empowered Learner Support	Apply technology resources to enable and empower learners
	Identify technology resources to empower learners for effective use of technology
	Facilitate equitable access to technology resources for all learners

Table 1. Emerging Technologies and Teaching Competencies

successful in the technology-rich 21st Century." In this context, teachers need to understand how the technologies work, what they offer, and to understand how to use them for betterment of teaching learning process. Teachers need to apply technologies wisely to real problems, and to reflect and search for the deeper issues that the technologies raise, and to bring up and discuss these issues with the students. The teachers also need to create evaluation criteria, and to make and understand the distinct criterions related to emerging technologies mediated teaching learning.

We need competent teachers for effective utilization of emerging technologies in present educational scenario. Making teachers' competent for emerging technologies is a task that requires efforts at different levels. As Gunter (2001, p.13) suggests, "To prepare educators for the twenty-first century, colleges of education must be leaders of change by providing pre-service teachers with a technology-enriched curriculum." In Indian context, three parties namely NCTE (National Council for Teacher Education), Teacher Education Departments/Institutions and School Teachers themselves can play important role to fulfill this task. The needed actions required at their part to make school teachers competent for emerging technologies are discussed under following subheads.

(A) National Council for Teacher Education (NCTE)

A number of studies conducted on the process of educational change show that education policies often lack focus that encourages the integration of technology content into the learning landscapes of schools. This is a clear indication that we must look for ways to re-orient and re-organize teaching learning process to promote technologies usage among teachers. Being the nodal institution of teacher education in India, National Council for Teacher Education (NCTE) is expected to play leading role to motivate and support school teachers to learn and use emerging technologies for educational purposes. The NCTE may take following initiatives to empower school teachers for emerging technologies:

Make emerging technologies an integral part of teacher education curriculum

Policy initiatives are the key to promote emerging technologies usage among teaching fraternity. Formulation and implementation of clear-cut policies and guidelines will help teacher training institutions and school teachers to accept and embrace emerging technologies for betterment of teaching learning process. Therefore, the first requirement at the end of NCTE will be to make emerging technologies an integral part of existing teacher education curriculum. Need based policies and guidelines by NCTE will pave the way for teachers to learn and use emerging technologies for betterment of teaching learning process.

Frame emerging technology based teaching learning tasks

The promotion of emerging technologies in schools depends on its use for teaching learning tasks. To support this cause, NCTE is required to frame mandatory 'emerging technologies based teaching learning tasks' in teacher education curriculum. NCTE already made it mandatory for teacher training institutions to establish 'Educational Technology Labs' and addition of this new mandate will further support teacher education departments/institutions to equip future teachers with emerging technologies mediated teaching learning skills.

Organize training programmes to promote emerging technologies usage

Training teachers is another major requirement to promote emerging technologies usage in schools. NCTE may fulfill this promise by conducting national/ regional level training programmes in all over the country on regular basis. These training programmes will help school teachers to have knowledge, skills, and understanding of concepts related to emerging technologies. Besides, these training programmes will further help teachers to stay abreast of recurrent and emerging technologies and updating of technology knowledge and skills.

Promote emerging technologies based researches

Research is vital to promote emerging technologies usage in classrooms. The researches help us to understand and assess the impact of emerging technologies on teaching learning process. NCTE may offer research grants and projects to willing teachers and researchers to conduct emerging technology based researches (particularly

action researches). Results from these studies will help the NCTE and teacher education departments/institutions to take specific measures for empowering teachers to use emerging technologies.

Prepare a resource pool of experts

It has been observed that majority of existing school teachers need orientation and training about use of emerging technologies for teaching learning purposes. Unfortunately, majority of our teacher training institutions lack expertise to train teachers for technological aspects. NCTE may play a leading role to serve this cause. NCTE may prepare a resource pool of experts having specialization and experience in educational utilization of emerging technologies and may depute these experts to train school teachers in different parts of the country.

(B) Teacher Education Departments/Institutions

To fulfill the educational needs of fast emerging society of digital native learners in schools, the existing pedagogical practices in teacher training programmes are needed to be replaced by e-pedagogical practices (the term e-pedagogy denotes the art and science of e-teaching). But this is not the case with our teacher training departments/institutions as majority of them lack focus to integrate technology content into pre-service/in-service teacher training programmes. Following measures will be helpful for teacher training departments/institutions to take care of this situation:

Provide infrastructural facilities for use of emerging technologies

We can help teachers by giving them a different perspective, by involving them in meaningful activities, and by allowing them entry into the knowledge networks that define teaching and learning, giving them the hardware, and some technical training, is the first part of their learning journey (Sutton, 2006). Following this advice, teacher training departments/institutions are supposed to mainly provide computer and broadband Internet connection as majority of above discussed emerging technologies are almost available for free. The other required hardware/software will include printer, scanner, digital camera, handy cam, audio-video editing software, etc. Availability of these facilities will help school teachers to overcome one of the most talked e-barrier regarding usage of technology in classrooms 'material access barrier' and promotion of in-house opportunities for teachers to learn and use technologies.

Support teachers to use emerging technologies

Everyone needs motivation to do any task. Our school teachers also need incentives and promotion to learn new technologies. Therefore, it will be worthy for teacher education departments/institutions to offer incentives and encouragement to motivate school teachers to learn emerging technologies for betterment of teaching learning purposes. Besides, they may also devise a strategy to reward 'e-activities' of school teachers to motivate them for using emerging technologies for teaching learning tasks. These measures will certainly help teachers to make attitudinal changes and come up with new and innovative ideas to use technologies in educational settings.

Provide training about emerging technologies

The researches again and again pointed out about lack of training facilities to train school teachers for world of emerging technologies. Therefore, we need some innovative efforts to train our school teachers for emerging technologies. One of such innovative effort can be peer tutoring. It is a well known fact that in every teacher training department/institution, there are always few teacher educators/trainees who are good in technologies usage. The teacher training institutions may take the services of these technology user teacher educators/trainees to train those teachers who are not so good users of technology. Besides, teacher training departments/ institutions may also invite experts from nearby technical institutions for providing training to their teachers about emerging technologies.

Create environment for emerging technologies mediated teaching learning

Producing supportive environment is key for promotion of emerging technologies usage among school teachers. School administration can help a lot for this cause by offering healthy environment for emerging technologies mediated teaching learning in their schools. The first requirement to create this environment will be to offer a democratic and encouraging set-up for teachers in schools. The schools will be further required to offer

incentives and appreciation to those teachers using emerging technologies. This measure will help teachers to freely embrace and use emerging technologies for teaching learning activities.

Collaborate with other educational institutions

Sharing and learning together is the best way to use emerging technologies. Teacher training departments/institutions may collaborate with other institutions to share best practices among emerging technologies by establishing 'emerging technologies clubs' in their campuses. The main aim of these clubs will be to provide a common place for teacher trainees of different institutions to share their expertise and concerns about emerging technologies. During the meeting of these clubs, the proficient users of technologies will share their expertise and experiences with fellow teachers. Their experiences will motivate other teachers to use emerging technologies for betterment of teaching learning process.

(C) School Teachers

The worrisome fact is that although learners have grown up digitally and may be masters of technology, but the teachers who teach their future has been handicapped with a lack of sufficient knowledge about the use of technology. Majority of school teachers are trapped in their educational practices by a lack of meaningful exposure to good information on the use of technology and of how to initiate new ways of sharing information that will help them to move forward. The following strategies may be helpful for school teachers to come-out of this situation by mastering emerging technologies.

Update knowledge and skills about emerging technologies

The emerging technologies are changing fast and their effective and fruitful use demands updated knowledge and skills. The first action on the part of school teachers to make this happen will be to continuously learn and update them about emerging technologies and their educational usage. They are required to learn these technologies either in their schools or in other educational institutions by attending different training programmes. The teachers may also take the services of emerging technology experts/peers to learn emerging technologies.

Use available technologies

Instead of searching for best emerging technologies, use of available technologies is the best way to promote emerging technologies usage. Following this dictum, school teachers are required to start using available emerging technologies. This measure will help teachers to shed their inhibitions and create a liking about using emerging technologies for teaching learning process in a better way.

Share best practices among emerging technologies

The emerging technologies thrive on the idea of sharing. The main benefit of sharing about technologies is that more you share more you learn. Therefore, technology sharing is a vital component for preparing school teachers for emerging technologies. To ensure the maximum benefit of these technologies, school teachers need to know about the ways of sharing them. To achieve this objective, the best strategy for teachers will be to regularly attend programmes to learn updated knowledge and skills about emerging technologies and sharing of best e-practices with their peers.

Discuss and Do technology mediated teaching with peers

Discussion and using together is one of the best ways to learn emerging technologies. Discussion helps us to learn emerging technologies in a better way while collaborative usage supports one to use technologies in more confident manner. The school teachers are required to have a new beginning by applying this principle. Adoption of this principle will certainly help them to promote technology mediated teaching learning in their schools.

Learn emerging technologies from their students

The excellent educational institutions of the world thrive over the idea 'Learn from your Learners'. Unfortunately in India, we are not appreciative of this idea as mainly students learn from teachers and teachers hardly learn from students. Whereas, learning from students offer numerous opportunities for teachers to learn and promote emerging technologies usage in education. Therefore, school teachers are required to correct this trend by showing their desire to sit with their students and learn from them about emerging technologies. This learning will

ultimately help them to use technologies for betterment of teaching learning process.

Conclusion

In present circumstances, it is expected from school teachers to become informed users of emerging technologies. They are required to know about software usage as well as some hardware basics and an understanding of networks (local area and Internet). School teachers are further expected to find and adapt efficient measures for learning and using emerging technologies, which are bound to grow well beyond what we envision today, as observed by Daanen and Facer (2007, p.04), "If educators are to shape the future of education (and not have it shaped for them by external technical developments) it is crucial that we engage with developments in digital technologies at the earliest stages. We need to understand what may be emerging, explore its implications for education, and understand how best we might harness these changes." The author has a belief that adoption and implementation of proposed action plan by key parties namely NCTE (National Council for Teacher Education), Teacher Education Departments/Institutions and School Teachers themselves will certainly be helpful to empower school teachers to learn and use emerging technologies for joyful and effective teaching learning process.

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