Digital ICT in Education
Deconstructing Myths and Realities

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Abstract

Myths play a powerful and significant role in curriculum and educational practices. They generate a range of responses from the teachers, teacher educators and educational researchers. Some of us seek to challenge and transform persistent myths associated with the curriculum; others may focus on interrogating myths understood as popular misconceptions in teaching and learning; still others consider myths as powerful narratives and stories that evoke timely or timeless messages about current educational practices. Myths can be productive learning tools, as they create and sometimes recreate narratives that are neatly wrapped around culturally based messages and truths. However, many of them have a darker side; some are irrational and others are beguilingly but ultimately dangerously attractive.

Deconstructing the mythical thinking about digital ICT is highly significant for promoting critical thinking, constructing sound knowledge and preventing ignorance-based mistakes in educational practices. This paper attempts to create awareness among the educators and researchers about how our beliefs and views on ICT in education are built; invites them to critically consider to what extent these beliefs and views have rational and evidence-based grounding; and emphasises the need to identify and challenge the myths of ICT in education that prevent productive and evidence-based approaches to current educational problems.

Introduction: Computer as a Panacea

Education is a complex social endeavour where problems related to teaching and learning do not have any shortcut answer or solution. But educators are tempted to look for easy means to resolve many of the

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deep-rooted problems encountered in the profession. The discourse of technology particularly those of ICT have contributed significantly to the idea of computer as a panacea for educational improvement. In 1922, Thomas Edison predicted, 'the motion picture is destined to revolutionise our educational system and in a few years it will supplant largely, if not entirely, the use of textbooks'. This did not happen, and the use of textbook became more predominant than ever before in education. In 1950s, B.F. Skinner's teaching machine also promised much more than it could deliver. However, new digital technologies powered with ICT live up 'Edison's optimism' for replacement of textbooks; but surely not with motion pictures or teaching machines. The strong advocacies of both corporate and governmental agencies for integrating ICT in education has impelled both policy makers and educational practitioners to refer to computer-related technologies as a solution for all the challenges of education.

Ornellas and Sancho (2015) analysed a variety of literature on ICT and highlighted how the notion of computer as a panacea for educational improvement is embedded in the discourses of technology in education. A brief summary of their analysis is recounted here. In 1979, Seymour Papert stated that there was no evidence to show that introduction of television, movie, language labs and other educational hardware have made a significant difference in the field of education; nor did the innovative curricula of 1960s. But he asserted that the powerful computer could have done so.

Such hopes got a powerful push when in 1995 Bill Gates and associates claimed that Internet was going to provide 'seemingly unlimited information, anytime and anywhere'; that it 'will bring together the best work of countless teachers and authors for everyone to share'; and that it 'will help spearhead educational and personal opportunities even to students who are not fortunate enough to enjoy the best school or the greatest family support'. Thus, all children will be encouraged 'to make most of his or her native talents'. Here the position is very simple: 'give Internet access to everybody and most educational problems will be solved'.

In 2006, Sanna Jarvela claimed that ICT can increase authenticity and interest in learning; build virtual communities; help to share perspectives among students with different expertise; provide peer support and benchmarking practices in different field; facilitate the use of technology-supported inquiry approach and problem-based models; provide innovative ways of integrating 'just in time' support and interaction. All these claims are well and good but could be true only in a rich pedagogical environment. A decontextualising of these claims to the contemporary teaching and

learning practices would bring out an educational myth: 'use ICT in school and in the home and all learning problems will be solved'.

And in 2011 Heuston affirmed that we are approaching the 'final miracle'; schools and educators are 'finally moving into position to introduce new technologies working at a speed of light that are capable of providing educational excellence and equity to all children on the globe almost overnight'. The assertion is very clear: buy the newest digital technology today and all your educational (and social) problems will be solved tomorrow.

Educationists, practitioners and technology professionals up hold different perspectives on the possibilities and pitfall of computing technologies in education. Bigum and Kenway (1998) identified and described four such perpectives: (i) *Boosters,* who were optimistic advocates of computers in edcucation; (ii) *Doomsters*, who dwelled on the problems; (iii) *Anti-schoolers,* who predicted the end of the 150-year-old model of schooling; and (iv) *Critics,* who were aware of the obstacles and threats. In the last two decades 'the number of boosters has considerably increased. Doomsters' voices seem to be fading, anti-schoolers are gaining the greatest foothold in higher education and home schooling, and critics continue to argue for a more rigorous and evidence-based approach to the benefits and drawbacks of digital technologies and their adaptation in educational policy and practice (Sancho 2010).

One can have one's own perspective on the use of digital technologies in education. The critics follow an evidenced-based approach to judge the pros and cons of ICT and its adaptation in the educational policy and practice. They search for the best ways to use and integrate digital technologies and focus on understanding how this kind of technology is transforming people's lives, ways of learning and interests. Nonetheless, a dispassionate scrutiny of the weak and strong contributions of ICT to education is needed to deconstruct a set of unfounded beliefs and myths.

Conceptualising Myths

Oxford dictionary depicts myth as a traditional story that describes the early history of a people or explains a natural event; a widely held belief that is not true. Myths can be construed 'as sources of enriching origins or as something darker, where thoughts turn to false ideas or lead people in the wrong direction' (Ornellas and Sancho 2015). According to Arthur W. Combs, people behave according to their beliefs and the damage done to human thought and actions by the myths people hold is incalculable. He states that 'Myths are major factors behind inefficiency of institutions, breakdown in communication, and failure to cope with many modern problems. In educational

thinking and practice, they create a continuous barrier to innovation and change'.

In his collection of essays, *Mythologies,* Roland Barthes (1972) examines myths of bourgeois culture and dissects their functioning in everyday practices. Barthes considers myth as a system of communication; a message or a mode of signification. He shows how myths can easily become ideologies, naturalise certain norms, and prevent people from being reflective about them. For Barthes, certain myths remove history, thus giving the impression that something simply exists and does not need to be questioned; myths allow the mere statement of fact to emerge and thus a certain idea of unquestionable truth develops. On the basis of these examples, one can see how dangerous the myths can be for education.

However, myths can help to explain a practice, belief or natural phenomenon. They are sustained in popular beliefs or traditions that have grown up around something or someone. The philosopher Willard Van Orman Quine argued that all basic epistemological assumptions, be they sensu stricto myths or conceptions that there are physical objects or phenomena, are mythical in nature. The myths may differ from each other in degree, but have the same nature or perform the same function (cited in Ornellas and Sancho 2015).

According to Barthes, myth is not defined by the object of its message, but the way in which it utters this message: there are formal limits to myth; there are no 'substantial' ones. Hence, everything can be a myth. But there are no eternal myths; for it is human history which converts reality in to myth, and it alone rules the life and the death of mythical language. Ancient or not, mythology can only have a historical foundation, because myth is a type of speech chosen by history: it cannot possibly evolve from the 'nature' things (Barthes 1972). The myths of ICT in education considered in this paper are in tune with the above conceptions about myths. The analysis is centred on the major assumption held by a good number of policy makers, and educational professional that digital ICT will effectively improve education per se.

Making of ICT Myths in Education

The term technology has a wide range of meanings. Gentry (1995) analysed diverse conceptions about technology offered by scientists, educationists and educational technologists. His synthesis of all these conceptions considers technology as 'the systemic and systematic application of behavioural and physical science concepts and other knowledge to the solution of problems'. He asserted that use and misuse of technology depends on the values of those who employ it; the application of technological solutions to one problem may create other problems which may be more serious than

the original problem; applications of technology should be selected and/or continued only after determining that desirable consequences outweigh considerable consequences.

However, most educational literature on computers and ICT, use the term 'technology' to refer to a specific kind of technological development, i.e., a set of sophisticated digital tools. This view of technology, according to Ornellas and Sancho (2015), creates unpredictable consequences. For instance, it fosters the idea that technology is only computers, the penultimate digital gadget. Such a belief leads the teachers and students to think that they do not use technology if they are not in front of a computer or a mobile phone. My own experiences with the pre-service teachers ratify this. When asked about 'educational technology' they used to refer to computers, mobile phones and other digital ICT gadgets. Few would refer to application of scientific knowledge to the solution of educational problems. They do not take into consideration the different technologies that over the years have been turning the school into what it is today. This may be true for the present day in-service teachers too.

Why do student teachers refer only computers and digital gadgets to 'technology'? Perhaps many of these new-generation learners are born and bought up in the environment of digital technologies and may not be acquainted properly with the concept of educational technology at large and its implications in educational thinking and practice. Another reason could be ubiquitous nature of the ICT that has made other technologies invisible to the users of computers and Internet technologies. Mark Weiser (1990) argues that 'the most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it'.

However, when the technologies 'disappear' they can also become dangerous. Because, the people tend to think that technological developments enjoy an autonomous power; and look upon the technologies almost as natural force, beyond human will and responsibility. They may also take it for granted that the power of technologies will automatically bring qualitative improvement in different walks of their lives. This reductionist and uncritical view of technology prevent people from seeing that technology is not a 'thing' in the ordinary sense of the term, but an ambivalent process of development suspended between different possibilities (Aznar 2005, Hanson 2013, cited in Ornellas and Sancho 2015).

Major ICT Initiatives in India

In India, the need to employ educational technology to improve the quality of education was prominently figured in the National

Policy on Education 1986–1992. This led to launching of two major centrally sponsored schemes: (i) Educational Technology (ET) and (ii) Computer Literacy and Studies in Schools (CLASS). In 2004, Government of India launched a more comprehensive scheme — Information and Communication Technology at Schools. The role of ICT in school education is highlighted in the National Curriculum Framework 2005. Use of ICT for quality improvement also figures in Government of India's flagship programmes on education, Sarva Shiksha Abhiyan (SSA). Again, ICT has figured comprehensively in the norm of schooling recommended by the Central Advisory Board of Education (CABE), in its report on Universal Secondary Education, in 2005.

Inspired by the 'tremendous potential of ICT for enhancing outreach and improving quality of education' the Government of India brought out a National Policy on ICT in School Education in 2012 and accordingly in 2013 NCERT formulated a curricula for ICT in education. In 2015, Prime Minister of India launched the Digital India programme with an aim to ensure that government services are made available to citizens electronically by improved online infrastructure and by increasing Internet connectivity. The other initiatives, policies and programmes that are followed include studying web called SWAYAM for offering free online courses, National e-Library; National Mission on Education through ICT; e-Pathshala; e-PG pathshala, Shala Darpan; Swayam Prabha DTH educational channels, and National Repository of Open Educational Resources.

The policy narratives on digital technologies reflect several assertions about ICT in education that resound some of the mythical thinking referred above and those that are to be deconstructed later in this paper. For instance, the National Policy on ICT in School Education aims at 'preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socio-economic development of the nation and to be geared for global competitiveness'. As per the policy document (Government of India 2012) ICT has the following potential to respond to the various challenges of the Indian education system:

1. ICT can be beneficially leveraged to disseminate information about and catalyse adaptation, adoption, translation and distribution of sparse educational resources distributed across various media and forms. This will help promote its widespread availability and extensive use.
2. (Hence) there is an urgent need to digitise and make available educational audio and video resources, which exist in different languages, media standards and formats.

3. Given the scarcity of print resources as well as web content in Indian languages, ICT can be very gainfully employed for digitising and disseminating existing print resources like books, documents, handouts, charts and posters, which have been used extensively in the school system, in order to enhance its reach and use.
4. ICT can address teacher capacity building, ongoing teacher support and strengthen the school system's ability to manage and improve efficiency, which have been difficult to address so far due to the size of the school system and the limited reach of conventional methods of training and support.
5. There is an urgent need to develop and deploy a large variety of applications, software tools, media and interactive devices in order to promote creative, aesthetic, analytical and problem solving abilities and sensitivities in students and teachers.

The assumption is made clear in the mission statement of the policy that 'ICT and ICT-enabled activities and processes (will certainly) improve access, quality and efficiency in the school systems. In other words, infusion of ICT in education would automatically resolve all the problems in the field of education and would even ensure all round development of the country.

The curricula for ICT in education has gone a step ahead. It claims that "A decade long infusion of computers and more recently ICT, have demonstrated varying impacts on learning". The statement indicates that whether the use of computers and ICT in school education has led to a substantial gain in the learning achievement of the students at different stages of education is yet to be established empirically. A more interesting and critical claim made by the ICT curricula is that "For the students, it (ICT) is an initiation into creativity, problem solving, and an introduction to the world of information and technologies which could also shape career pursuits" (CIET 2013). It may be true for some of the students who are educated to care for a critical understanding of the knowledge, skills and attitude they develop.

However, this author's experience as a teacher educator is that most of the pre-service teachers who have acquired considerable skills in the use of ICT tend to do their learning assignments in an easy way using the 'cut and paste' options of the technology without even reading and understanding the material they have downloaded from the Internet. It is beyond imagination to think about what they would do in the classrooms when they become teachers in the schools. On the other hand the huge turn-out of the IT graduates and post graduates that the author witnessed in recent interviews held for a few posts of computer typists for various projects itself reveal the gravity of

unemployment prevalent among the IT graduates in the country. Hence, it would be mythical to think that learning ICT in schools will surely enable the students to pursue a career in any sector.

Myths about Digital ICT in Education

The current buzz about ICT is due to its inherent potential, such as abilities of the technology to reach large number of individuals (e.g., radio and TV), interaction (e.g., telephone, social networks), rich media transmission (e.g., DTH TV channels), integrating all forms of media (e.g., multimedia), huge storage capabilities, quick search (as in computerised databases), and ubiquitous access (anywhere at any time). Of course ICT can play a significant role in education. But the current discourse on the role and value of ICTs in education disseminates many mythical beliefs among the teachers, trainers and students about the potential of these technologies and this necessitates a critical rethinking. The most commonly held myths that traverse these narratives characterise ICT 'as computers and Internet'; and 'as a panacea for all ills in education'. The other myths are like this: 'ICT can replace teachers and schools'; 'Effects of ICT are definite'; 'ICT is a monolithic entity'. However, the three myths identified and deconstructed by Ornellas and Sancho (2015) bear much significance for the prevailing excitement about ICT in Indian education. The analysis of myths that encompass more or less the ones referred above would provide an opening to the educational professionals in deconstructing the myths in education at large.

Myth 1: Providing schools with ICT is enough to improve education.

This myth embraces many assumptions about the role of digital ICT in teaching and learning, such as

(a) top-down theories and policies are sufficient for making decisions about introducing new devices into schools,
(b) digital ICT-based teaching allows interactive, creative, adaptive, constructivist and motivating learning and
(c) digital ICT is a driving force of innovative teaching.

Over the last three decades most of the countries in world have been implementing diverse plans and programmes for integrating ICT in education. The reasons to justify this kind of educational policy in the Western countries are adjustment of the school system to the characteristics of the information society; getting students ready to face the digital culture; increasing and improving the quality of teaching processes and fostering innovative teaching methods and materials (Ornellas and Sancho 2015).

The brief description of the initiatives in India presented earlier affirms that the overarching justification for the policy on ICT in education is nothing but 'preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society'. The policy perceives ICT as an 'omnibus support system for education'. The explicit and implicit agenda is to 'develop alternate modes of education, continuing education, teacher capacity building, and information systems for efficient management of the school system'. In order to implement the policies and programmes of the government to integrate ICT in education, the stakeholders involved in school education are repeatedly proposed to use the ICT tools in the teaching and learning processes. Accordingly directions were given to the state governments and Boards of Secondary Education to develop their own ICT curriculum, ICT programmes, and evaluation schemes as well as to institute an ICT literacy programme across the school classes. Many of the states have started implementing the provisions of the ICT policy.

In this context it would significantly consider some of the findings of the studies on integration of ICT in education in other countries. Studies from different contexts in the American and European countries show that in spite of the considerable efforts made and the resources allocated for enhancing the use of technology to support learning, the expected transformations or improvement of learning as a result of using digital ICT have not been confirmed. And, there is little evidence to sustain that investments in digital technologies have a significant return in teachers transforming their teaching practices or producing gains in student achievement. Providing access to digital ICT has not led to either substantial changes in teaching practices or increase in student academic achievement (Ornellas and Sancho 2015).

The reality in India may not be different. The scenario of ICT integration in teaching learning process in my organisation, Regional Institute of Education, Mysore, a constituent unit of NCERT can be taken as a case. Over a decade or so the Institute has developed a comparatively good digital infrastructure. With three computer application labs, an audio-visual studio and several smart classrooms, the Institute provides ICT education to all of its student teachers especially at the undergraduate level. They have free access to Internet and Wi-Fi connectivity in the campus including library and the hostels. Almost all the students have their own smartphones. The heads of the departments and faculty members are provided with laptops and desktops, respectively, and Internet connectivity through broadband and Wi-Fi is also available to them.

In-spite of the availability of these advanced digital technologies to both faculty members and students the teaching learning process remain to be conventional at large. Even the faculty members who are well-versed in ICT skills focus on information delivery through lectures and technologies. The evaluation process is still dominated by paper-pencil tests and written assignments. Diminishing standards in the quality of students learning is a point of discussion among the faculty members, especially in the centralised valuation camps at the end of every semester. All these are certainly a concern for an institution like RIE to reflect upon in this digital age.

However, research-based evidence is required to substantiate that the efforts made in the country for the last two or three decades to employ educational technology or ICT to enhance the quality of education have really improved or not the teaching practices and made substantial gain in students' achievement. Infusion of ICT in teaching learning may have changed the nature of the learning experience, but it is significant to understand the extent to which the use of ICT has influenced a range of learner outcomes and what aspects of the ICT-augmented experience appear to have made a difference. As of today there is no comprehensive field-based study available on the Net that discerns a direct, causal relationship between ICT use and attainment, although many studies reported improved attainment as one of the number of outcomes of increased ICT use in an experimental setting.

Thus, it is wise to keep in mind that the use of the 'current and emerging ICT tools' in themselves do not automatically result in the development and implementation of new approaches to school or academic knowledge, in the transformation of teaching and learning methods or development and implementation of new ones, and in the solution to educational problems of the country. It would be futile to think that mere availability of a wide range of digital resources for teaching learning will automatically lead to 'transformation of classrooms into ICT-enabled classrooms' and make a significant change in the academic attainment of the students in comparison with well-planned learning experiences executed without the support of digital technologies. According to Ornellas and Sancho (2015), there are several other elements to be considered if digital ICT is to be implemented in schools from an educational innovative perspective. These elements are

- an adequate source of funding for acquiring and maintaining the needed infrastructure, with external support to rapidly solve the technical problems,
- an organisational environment that supports and propels technology-driven innovation,

- the professional development of teachers implemented from a practical-critical perspective and related to the development of school-based improvement projects,
- a favourable predisposition from the teachers towards the integration ICT into their teaching practice,
- a deep reorganisation of school time and space and a redistribution of ICT in the different learning environments and
- a holistic vision of the curriculum that facilitates the development of transdisciplinary learning experiences that enhance authentic learning, problem-solving activities, development of higher-order thinking skills and collaborative learning.

Above all a strong academic leadership is required for every educational institution to steer the organisation to achieve its educational vision. In short, the digitally driven educational innovation is virtually impossible if the rest of the system remain unmovable.

Myth 2: Students learn better and more with ICT because they are digital natives.

Introduced in 2001 by Marc Prensky, the concept of digital natives has been proliferated in the literature on young people and digital technology over the past decade. The other terms that correspond to the digital natives are net generation or millennials. Prensky described 'digital native' as the generation who have been born since 1980 and grown up with new technology. He posits that this generation has specific characteristics of having spent their entire lives surrounded and using computers, videogames, digital music players, cell phones, 24×7 access to Internet and digital tools. They think and process information differently and are used to getting information on the World Wide Web at the press of a key rather than textbooks and libraries. In contrast to the digital natives, Prensky describes 'digital immigrants' as the generations who were not born into the digital world but have become fascinated by and adopted many or most aspects of the new technology (Darbha and Rao 2016). The International Telecommunication Union (ITU 2013) defined digital native 'as a youth, aged 1,524 inclusive, with five years or more experience of using the Internet.

In India, the notion of digital natives is not yet widely found in the literature on digital learners. It is argued that India's digital journey is merely of 20 years or less. Hence, unlike the Western nations, only those who were born after 1995 can qualify as digital natives and they are not yet part of the work force or are just making an entry. Nonetheless, this generation forms a decisive part of the consumer and customer base for most of the organisations and are

the current target segment (Darbha and Rao 2016). As per Measuring Information Society Report 2016 (ITU 2016), India stands at the 138th position in the global ranking with an ICT Development Index (IDI) of 2.69. Republic of Korea occupies the top IDI ranking with value of 8.84. Two other countries' in the Asia-Pacific region — Hong Kong and Japan — also rank in the top 10, along with seven countries from Europe: Iceland, Denmark, Switzerland, the United Kingdom, Sweden, the Netherlands and Norway.

According to the literature on digital learners the contemporary students are supposed to be digital natives who are fluent with digital technology and possessing sophisticated technical skills and learning preferences for which traditional education and teachers (digital immigrants) are unprepared (Ornellas and Sancho 2015). In the world of Prensky, digital natives have been conditioned by their technological environment to expect immediate responses. They prefer random non-linear access to information (i.e., hyperlinks), and have a preference for images over text-based content. Described as multitaskers, they are comfortable being engaged in several tasks simultaneously. They are also characterised as being impatient with slower, systematic means of acquiring information and knowledge, and expect instant response and gratification or reward from the technologies they use. Additionally, according to these theories, they are highly adaptive, function best when networked, and use a range of technologies to network with their peers (ITU 2013).

There are several other assertions about the young generation who have grown up immersed in the new technologies. Smith summed up all such statements in to eight dominant digital native claims: (i) Possessing new ways of knowing and being; (ii) Driving a digital revolution, i.e., transforming the society; (iii) Innately tech-savvy; (iv) Multitaskers, team-oriented and collaborative; (v) Native speakers of the language of digital technologies; (vi) Embracing gaming, interaction and simulation; (vii) Demanding immediate gratification; and (viii) Reflecting and responding to the knowledge economy (cited in Ornellas and Sancho 2015). Prensky claims that 'the digital natives exceed what many adults know or even consider worth knowing; therefore, educators and educational system need to invent digital native methodologies for all subjects at all levels, using our students to guide us'. But the critics say that there is no research-based evidence to substantiate the digital native theory and its claim about the link between young people and ICT. Therefore, there is a need for a more measured realistic approach to investigate the nature of today's learners and its implications for education (Ornellas and Sancho 2015).

The analysis of studies and review of literature on young people

and ICT made by Ornellas and Sancho reveals that contrary to the imagined collaborative communities of content creation many young people's engagement with technology is far more passive, solitary, sporadic and unspectacular, be it at home or in school; that today's learners, regardless of age, are on a continuum of technology access, skills, use and comfort. Although many of the students are fluent in digital ICT technical skills, they have very little understanding of how to create a network for learning, how to manage information overload, how to work collaboratively, how to make information work for them, how to use information legally and ethically or how to successfully use the Internet and other research tools. In short, though the digital technologies are an important part of their lives its role in learning remains rather less expansive and empowering than the digital native claims proclaim.

It is true that the new generation has more affinity with the ICT tools than their elders. But some of the so called 'digital immigrants' can be fluent in digital technologies, some young people can be naïve and unsophisticated in their use. Hence, the propagated dichotomy between the digital natives and digital immigrants can be a dangerous myth as it put forth some compelling implications for how students, teachers and teacher educators to make use of ICT in teaching learning processes. The mythical assumption can lead the people to believe that the younger generation has easily transferable skills, which the elders do not possess. Therefore, research-based evidence is required to substantiate the real nature of the digital learners and their relationship with digital technologies.

Myth 3: Information society people are cleverer and better informed because they have unlimited access to information.

An information society is construed as a society where creation, distribution, uses, integration and manipulation of information is a significant economic, political and cultural activity. Its main drivers are digital ICTs, which profoundly change all aspects of social organisation, including economy, education, health, warfare, government and democracy. The People who have the means to partake in this form of society are sometimes called digital citizens. Yoneji Masuda used the term 'information society' to describe the significant social changes taking place in the second half of the twentieth century. The changes resulting from the huge dissemination of digital ICT in all areas of human life have been described variously: 'network society', 'information age', 'global society', and so on. But the two terms 'information society' and 'knowledge society' used interchangeably to characterise the change driven by

the ubiquity of digital ICT are very common in the digital discourse.

The ubiquitous Internet has made the access to information easy, fast and diversified. Now we are in a deluge of information which is flooding us. But simply having access to information does not mean that we have become more knowledgeable than ever. Carr (2010) observes that the information overload has a profound impact on people's ability to pay close attention to one thing over a prolonged period of time, and that can have a significant effect on the way people learn and make sense of information.

The information stored in human brain will not automatically convert into knowledge. The individual has to decode, organise, criticise, incorporate and transform it, and give it meaning, and generate new knowledge and understanding. Conversion of information into knowledge entails a mastery of certain cognitive, critical and theoretical skills that are precisely what the students in the contemporary societies need to develop. However, we cannot assume that this process will be automatically fostered by ICTs. Simply providing access to information is not enough. The students should be able to determine what information they need, what information they want access to and why, how to select and give meaning to it and how to apply it ethically in a given project.

The question of information load in education is not new. It has been much debated and discussed in the past. In 1992, the Government of India appointed a National Advisory Committee to advise on improving the quality of learning and to suggest ways to reduce the academic burden on school students. The committee observed that mechanical burden like the gravitational load of school bag on the children was a significant concern to be addressed, but the information load in the textbook and the burden of non-comprehension was equally cruel. The report of the committee states that the 'explosion of knowledge' idea prevents us from appreciating that leaning is not the same thing as storing information about different subject (Government of India 1993). Following the guidelines of NCF 2005 the information load in many of the textbooks has been reduced to a great extent. But deluge of information caused by the Internet reinvigorated the problem of non-comprehension among the new generation learners.

Therefore, what is needed right now is to help the students to decelerate, decode, and re-signify the informational deluge. The educators and educational institutions that focus more on information transmission through lectures or digital technologies need to review their functions. They should understand that students do not require so much of information, whether it is digital or printed. What they really need is thinking tools to know how to search for relevant

information, evaluate it, select it, structure it and incorporate it into their prior body of knowledge.

We have created many curriculum frameworks for school education, teacher education, and one for ICT education too. But what we did not develop is "frameworks for interpretation and thinking tools that allow students to: (i) compare and locate the relevant information and the accumulated knowledge; (ii) recognise the different codes and languages and to learn to use them to express their insights and arguments; (iii) make ethical judgments and continue learning throughout their lives' (Ornellas and Sancho 2015). The real challenge is to teach the students to navigate the digital ocean without being submerged by the information deluge, construct meaning of things they learn, and transform information and experience into knowledge by linking to real life situations. The digital ICTs have immense potential to depict and visualise concepts that children learn from textbooks. However, just like a picture or drawing cannot supplant a real object a virtual image, animation, or online video does not substitute an experience in real life setting.

Conclusion

There are deep rooted myths about ICT in education. A few of them have been deconstructed in this paper. There may be several other myths about the digital tools in education which need exhumation. Such mythical discourses are created mostly by people with little knowledge about the complexity of educational systems, but certainly with some interest in the development and profit due to digital ICT. The educational research that places too much emphasis on ICT tools and ignores rest of the components of education has also contributed to this mythical thinking.

The mythical thinking about the ICT has several dangerous consequences for education: (i) it feeds educators and policymakers and practitioner' ignorance; (ii) it prevents scholars practitioners and policymakers from looking for the real educational problems; (iii) it gives families the illusion of providing their children with the best possible education; (iv) it can guide investment to a single angle forgetting important, even fundamental, areas; and (v) it prevents complex and sound analyses and responses to today's educational problems, needs and challenges (Ornellas and Sancho 2015).

Oppenheimer's (2003) account of the state of education in America highlights the failure of the technology to improve the quality of education. He observes that the essentials of learning have been gradually forgotten and that they matter much more than the novelties of technology. Every time we computerise a science class or shut down a music programme to pay for new hardware, we lose sight of what our priority should be: 'enlightened basics'. He found

that in excellent schools, in which computers play a peripheral role, the tried-and-true methods of progressive education — inquiry, exploration, hands-on learning and focussed discussion — do more to develop students' intellectual capacities than technological gadgetry does.

The argument is not for removing computers from the classrooms and discouraging integration of ICT in education, but for a relook at what can and cannot be accomplished with the enormous investments they require. Policymakers, curriculum planners, teacher educators and teachers cannot ignore the basics: good teaching, small classes, critical thinking, meaningful work and the human touch. An uncritical approach to the process of education and implications of use of digital technologies in teaching learning processes can lead to mounting myths in education that can go counterproductive. The readers of this paper are invited to deconstruct and challenge the current and emerging myths and unsubstantiated epistemological assumptions about digital ICT and other aspects of education.

References

Barthes, R. 1972. (English Translation). Mythologies. The Noonda Press, New York. Retrieved from <https://soundenvironments.files.wordpress.com/2011/11/roland-barthes-mythologies.pdf>

Bigum, C. and J. Kenway. 1998. New information technologies and the ambiguous future of schooling: Some possible scenarios. In A. Hargreaves et al. (Eds.), *International Handbook of Educational Change.* pp. 95–115. Kluwer Academic Publishers, Dordrecht.

Carr, N.G. 2010. *The Shallows: What the Internet is Doing to Our Brains*. W.W. Newton, New York.

Central Institute of Educational Technology. 2013. *Curricula for ICT in Education.* [CD-ROM]. CIET, NCERT, New Delhi.

Combs, A.W. 1979. *Myths in Education: Beliefs that Hinder Progress and their Alternatives*. Allyn and Bacon Publishing, Boston. Retrieved from <https://www.morehouse.edu/facstaff/chewitt/Political%20Sociology%20Web%20Files/Myths%20in%20Education.pdf>

Darbha, S. and S.N. Rao. 2016. The Concept of Digital Natives and Digital Immigrants in Context of India. Retrieved from https://www.arcjournals.org/pdfs/ijmsr/v4-i4/1.pdf

Gentry, C.G. 1995. Educational Technology: A Question of Meaning. In G.J. Anglin. (Ed.), *Instructional Technology: Past, Present and Future.* (2nd ed.) pp. 110. Libraries Unlimited, Englewood, CO.

Government of India. 2012. National Policy on Information and Communication Technology in School Education. Retrieved from http://mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/revised_policy%20document%20ofICT.pdf

Government of India. 1993. *Learning without Burden*. NCERT, New Delhi.

International Telecommunication Union. 2013. Measuring the World's Digital Natives. Retrieved from https://www.itu.int/en/ITUD/Statistics/Documents/publications/mis2013/MIS2013_infographics_3.pdf

International Telecommunication Union. 2016. Measuring Information Society Report 2016. Retrieved from https://www.itu.int/en/ITUD/Statistics/Documents/publications/misr2016/MISR2016-w4.pdf

National Curriculum Framework. 2005. NCERT, New Delhi.

Oppenheimer, T. 2003. The Flickering Mind: The False Promise of Technology in the Classroom and How Learning can be Saved. Retrieved from https://www.buffalolib.org/vufind/Record/1243794/Reviews

Ornellas, A. and J. Sancho. 2015. Three Decades of Digital ICT in Education: Deconstructing Myths and Highlighting Realities. In M.K. Harmes et al. (Eds.). *Myths in Education, Learning and Teaching: Policies, Practices and Principles*. Pargrave Macmillan, New York.

Sancho, J.M. 2010. Digital Technologies and Educational Change. In A. Hargrieves, et al. (Eds.), *Second International Handbook of Educational Change*. pp. 433–444). Springer, Dordrecht.

Weiser, M. 1991. The Computer for the 21st Century. *Scientific American*, Vol. 265. No. 3. pp. 94–104.