Educational Communication in the Digital World

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Abstract. What in the discipline of education that is called 'Educational Technology' is called 'Educational Communication' in the discipline of Media Studies. Educational Communication in the digital world is being tackled by both the disciplines of Education and Media Studies. When education goes beyond the four walls of the classroom and incorporates some techniques of mass communication, Media Studies has a better hold to grapple with the issues. Learning through smartphones and the internet has become the norm. The students of today even in the formal education system use digital devices widely to supplement their classroom learning. Massive Open Online Courses (MOOCs) help formal and non-formal students to update their knowledge sitting anywhere, anytime. Even in the classrooms, devices like smart-boards have enhanced the teaching-learning experience. This paper traces the evolution of Educational Communication and examines the trends in the present digital world.

Keywords: *m-Learning, learner-centred approach, MOOCs, digital natives*

Introduction

In today's world, the media – particularly computers, smartphones, social media networks, and tablets – play a great role in education. Educational Technology integrates the media into education in a holistic way. This paper discusses Educational Technology in terms of e-learning, m-learning, ubiquitous learning, and e-content. Teacher-centred approach is giving way to a learner-centred approach. Teachers should be able to provide digital learning materials for the flexible use of learners. There is a growing divide between the teacher and the student. Teachers and students cannot afford to keep this strained relationship or disconnect. The relationship between the teacher and the student is a keystone in student achievement, motivation and engagement and in their capacity to trust what they know (Rodgers & Raider-Roth, 2006). Digital opportunities should be used to merge this divide. At a simple level, teachers join Facebook and interact with learners in an informal mode of communication.

The UGC Countrywide Classroom transmission telecasting higher education content nationwide started in 1984 and unfortunately, it ceased to be on air in 2014 and 2015, to be revived in the form of Direct-to-Home telecast. Particularly in the late 1980s and the early 1990s, many students benefited from the educational programming at a time when enrichment programming on television (such as those of Discovery Channel and National Geography Channel) was rare. But in this digital age, Educational Multimedia Research Centres (EMMRCs) which create the content of the UGC undertake e-content/MOOCs creation project as well under the National Mission on Education through Information and Communication Technology (NMEICT) of the Ministry of Human Resource Development (MHRD) to be made available through the internet.

B.F. Skinner's (1958) operant conditioning (the principle that behaviors followed by pleasant consequences are likely to be repeated) is the base for computer-assisted instruction (CAI). Several doctoral theses have been churned out creating CAI and validating it, and proving that CAI is better than traditional teaching. This stereotype conclusion itself is a fallacy, given the fact that teaching aids such as CAI can mostly be a supplement to the teacher and cannot replace the teacher totally. Media industry in the last two decades has overtaken this with a wide variety of multimedia materials made available on the internet and in CD/DVD/Blu-ray/pen drive.

Conventional CAI has given way to non-linear multimedia content involving 3D animation as well as simulation.

Educational Technology may be defined as three generations of technology. Instrumental technology (technology in education) uses instruments or tools to conquer some of the physical barriers the teacher confronts. Instructional technology (technology of education) conceptualizes the pedagogic and educational processes in a way appropriate to the context. Systems technology (technology with education) goes a step beyond the analytical approach as only synthesis will give a holistic approach.

Thus, Educational Technology is the development, application and evaluation of systems, techniques and aids to improve learning. It combines human and non-human resources to bring about effective instruction. Now in the digital era, we explore the potentialities and opportunities, with respect to Educational Technology.

'Noise' in Communication

Let me present the simple Shannon and Weaver Model of Communication. This is a transmission model. It was intended for the mathematical theory of signal transmission for telephones.

Figure 1: **Shannon and Weaver Model of Communication**
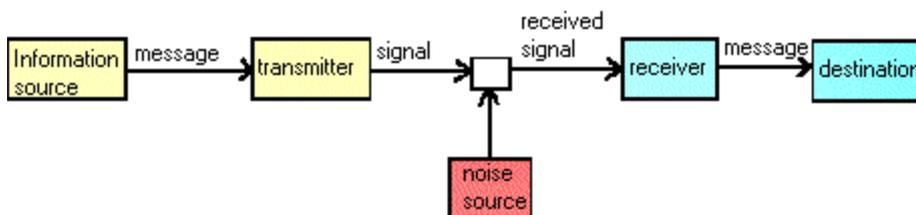
In this model (Shannon, 1949), message begins at an information source, which is relayed through a transmitter, and then sent through a signal towards the receiver. But before it reaches the receiver, the message goes through noise (sources of interference). The receiver must finally convey the message to its destination. A drawback of the model is its linearity. It looks at communication as one-way. That is remedied by the addition of the feedback loop in the developed version of the model, linking destination back with the information source. 'Noise' is undesirable input due to the barriers

that distort or diminish the messages. Noise may get in at the information source if the speaker could not find the right word or if he or she stammers. It may arise in the transmitter such as echo from the walls, reflection from the board or lack of readability of the words.

Table 1: Barriers (noise) to Communication

Types	Barriers	Remedies
Physical	Sound, distraction, ill-health, physical discomfort	• Seating arrangement • Audibility • Visibility
Language	Incoherent language, verbosity, symbols not explained, redundancy, unclear graphics	• Simple language • Explain graphics • Explain symbols • Audio-visual material • Feedback
Psychological	Disinterest, prejudice, unrewarding experience, anxiety, unfulfilled curiosity, inattention, perception	• Motivate learner • Show sympathy • Encourage questioning
Background	Previous learning, rote learning, cultural disparities, previous habit of not doing self-study	• Explain importance of new teaching method • Catch up with background • Need for prerequisites

e-Learning

Asynchronous e-learning offers self-paced courses. People can get the training they need any time. They can get the training to perform a task at hand. Self-paced courses may be delivered in several ways – be it internet, intranet or local area network, CD-ROM or DVD or Blu-ray or pen drive. The courses may have multimedia, interactivity, bookmarking, and tracking features. Some may have advanced features: simulation, online experts, multiple bookmarks, advanced search, and notes and highlights. You need external motivation to take and complete a course. Since self-paced courses can be offered without a teacher and without a required completion time, many will not enrol or complete the course (e-Campus News, 2013).

But there are professional and personal incentives to take up such courses. Learners may be provided with learning guidance to understand the learning material. This help may come from the professional group of which they are part of, or from experts specially employed for this purpose.

Teaching higher-level skill-based online courses without such functionalities will not be engaging. For instance, I could do an online course on HTML without external support but when I tried learning Java online I failed. Instead I could effectively do an online course on Editorial Writing with the support of a peer group when I worked with *The Hindu* newspaper. It is easy to learn online if the skill being learned is supported by the work environment.

Synchronous e-learning features classes over the internet in real-time. Here, learners can interact online with peers and experts. A virtual classroom substitutes a real classroom. Attendance is taken care of as the list of learners present is recorded digitally. Teachers can let learners speak through audio and video conferencing. Teachers and learners can use instant messaging and chat.

A blended learning programme combines e-learning and traditional learning methods. It can combine the convenience of e-learning, speed, cost effectiveness, and personal touch of traditional face-to-face learning.

m-Learning

In the concept of m-learning "m" stands for "mobile". Smartphones and tablets with internet connectivity transform how we access our shared knowledge sources. Learners access YouTube educational content or Wikipedia material, simply "googling". Not getting into the debate whether or not the content offered by Wikipedia is of quality, I could definitely say that even students at the higher education level use Wikipedia extensively. Effective tutorials are being delivered through mobile. New information is assimilated and doubts are clarified. The youth are more comfortable with touch screens than books. The cute hand-held devices and their constantly lowering costs bring education to your palm.

Teaching of the English language has been tried out through mobile phones in India. Reception is good among school dropouts, particularly girls. To cite an instance, an m-learning on Spoken English helped a group of young unmarried Muslim girls who were school dropouts (Aram , 2012). They secretly went to the terrace of their house to learn to speak English with the hope that someday they will come out of conservatism and start working. Their families would not like their children to continue studies or learn English because of conservatism. The girls who aspire to work someday sat

as a group in a terrace of a house and listened to English language lessons. Thus m-learning gives quality education to people who are out of formal education due to conservatism as well.

Telecom subscribers base in India reached 116.8 crore at the end of June, with Reliance Jio adding the highest number of new customers to its mobile network, according to a TRAI (2018) report. The number of telephone subscribers in India increased from 1,153.51 million (115.35 crore) at the end of May 2018 to 1,168.89 million (116.88 crore) at the end of June 2018, thereby showing a monthly growth rate of 1.33 per cent.

Drop in mobile phone prices has come as a boon to the rural poor. Mobile learning can take place in any location, at any time, including traditional learning environments such as classrooms as well as in workplaces, at home, in community locations and in transit. In this way, time will be fully used for learning. The mobile devices support videos, audios, flash, etc., and the internet directly. Mobile learning is based on new technology while the traditional courseware can also be shared with the help of some other easy-to-use tools (Fernandes, 2014). For example, students can view PowerPoint courseware on mobile devices easily.

According to Brown (2003), m-Learning is a natural extension to conventional e-learning practice through which mobile technology allows a greater degree of access to resources. It supports locational learning contexts such as field trips and museums. It enhances interactivity in contact teaching situations, and engages shy learners through use of a familiar, non-threatening learning environment.

Students use a mobile dictionary to define key words. They use a mobile encyclopedia to tell a brief account of a topic. They use a mobile camera to make a photo narrative of group work (e.g. of the National Service Scheme). They even use a mobile camera to make a video / documentary. This is how m-learning differs from e-learning. m-Learning provided a distilled-down version – learning "nuggets". "Just enough" i.e. brief content. On demand (Just-in-time) learning. It facilitates learning during naturally occurring disaster times. Some such bits of information were effectively passed on during the 2015 Chennai floods through WhatsApp.

Mobile learning provides enhanced collaboration among learners, access to information, and a deeper contextualization of learning. Hypothetically, effective mobile learning can empower learners by enabling

them to better assess and select relevant information, re-define their goals, and reconsider their understanding of concepts within a shifting and growing frame of reference (the information context). By assessing the degree to which all the areas of the Frame model are used within a mobile learning situation, practitioners may use the model to design more effective mobile learning experiences (Koole, 2009).

Figure 2: **Marguerite L. Koole's Framing Mobile Learning**
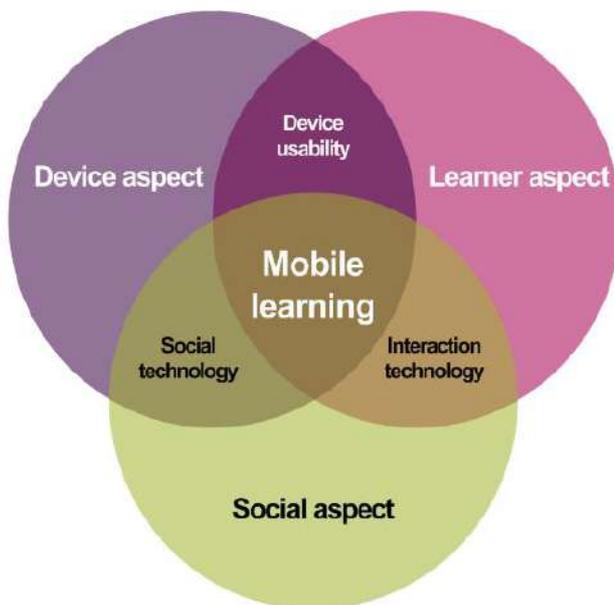
The Framework for the Rational Analysis of Mobile Education (FRAME) model by Marguerite L. Koole (2009) describes mobile learning as a process resulting from the convergence of mobile technologies, human learning capacities, and social interaction. It addresses contemporary pedagogical issues of information overload, knowledge navigation, and collaboration in learning. This model is useful for guiding the development of future mobile devices, the development of learning materials, and the design of teaching and learning strategies for mobile education.

In m-learning, there is an issue of responsibility, choice and control. Self-management of learning is the extent to which an individual feels he or she is self-disciplined and can engage in autonomous learning. Learners are in control of your success and failures. Learners need to have a positive

attitude. Accept responsibility for your actions, achievements, and failures, understanding that your success and failures comes from your own effort.

Technical issues include: connectivity and battery life; screen size and key size; ability for authors to visualize mobile phones for delivery; possibilities to meet required bandwidth for non-stop/fast streaming; and reworking existing e-learning materials for mobile platforms.

Some of the advantages of m-learning are: Mobile applications can help promote inclusive growth; Location-specific and demand-driven information; Mobile phones can provide dynamic information in the vernacular language (audio, video and text); Formal learning can be ably supplemented with mobile learning. More mobile-friendly e-learning content available, e-governance in educational institutions can be enabled with mobiles. The present generation technologies like 'WhatsApp' application for smartphones are very useful. WhatsApp helps easy access and sharing of information at no cost. In a conventional SMS we need to pay for each message. The need for a person to open a mail has also drastically reduced as documents can be sent through these new age apps. Information can be a photograph, audio or video. Learners can share class notes and model question papers among themselves, by just clicking the content as a photograph and sending it as a group message.

Students use smartphones to photograph lecture notes and book texts and share the files among fellow students. Trainers use YouTube to post their lecture presentations and video clips. Conventional non-linear Computer-Assisted Instruction (CAI) has evolved as e-learning.

Here are a few tips to avoid common errors in multimedia
presentation using PowerPoint software:
Do not use pictures of foreign teachers and children
- Select sans-serif fonts such as Arial or Helvetica; not Times New Roman
- Use font size minimum of 24 point
- Use different size, colours and styles
- One thought per line
- Use dark text on light background
- Keep background consistent
- Do not use all caps
- Use less graphics on given slide

- Check spelling and grammar
- Glance at bulleted points and speak
- Keep typed text to a minimum.

Some courses are now offered on the internet, with student assignments or journals or essays posted on the internet. This also forces the teacher to be constantly innovating. Communication technology has become a big part of everyday lives, and these advances are extending to classrooms. Innovators are thinking outside the boxy computer monitor now and advancing all sorts of creative uses for technology specifically designed for education. Take a look at these new advances in "EdTech". You know that people learn in many different ways and at different times. No single e-learning method is best for every learning need. You will most likely need to use several e-learning technologies as well as traditional learning methods.

e-Content

Multimedia learning material (MLM) is an old wine in a new bottle. e-Content is CAI in a new multimedia and multisensory form. It follows a four-quadrant approach: e-tutorial, e-text, web resources, and self-assessment. e-Tutorial involves video & audio, animations, virtual labs and simulations. e-Text includes downloadable transcripts, PDF materials, e-books and illustrations. Web resources are related links, open content, case studies, anecdotal information and historical development available on the internet. Self-assessment includes quizzes, frequently asked questions (FAQs), discussion forums, assignments, and multiple-choice questions.

Learning object repositories (LORs) too are created as part of e-content programming. LORs are short answers (1-2 minutes) on video, graphics, animations and text to a number of questions arising in a module. LORs are in response to the need for high quality, reusable instructional materials that are organized to be easily searchable.

e-Learning should have an instructional design strategy. Audio, video, graphics and text should be in proper combination. Learning here combines auditory (learning by hearing), visual (learning by seeing), and kinesthetic (learning by doing). Demonstration of a process is best shown with a video than a static graphic. e-Learning should use familiar ways of navigation so that the learner can navigate without any training or help.

The Indian Ministry of Human Resource Development (MHRD) and the University Grants Commission (UGC) are providing college teachers with funds to create e-content modules based on syllabi. Except in a few cases where the content is uploaded in YouTube or in websites, most e-content thus created is hidden from the public eye. The National Programme on Technology Enabled Learning (NPTEL) hosted by the Indian Institutes of Technology (IITs) with the support of MHRD offers quality content through Creative Commons, accessible free through the internet. Although the NPTEL content is on engineering it is beyond the difficulty level of non-IIT engineering students, requiring some bridge training which is now being offered through NPTEL clubs.

Massive Open Online Courses (MOOCs) are extensions of e-learning courses. They are online courses aimed at unlimited participation and open access through the internet. Besides traditional course materials such as filmed lectures, readings, and problem sets, many MOOCs provide interactive user forums to support community interactions among students, teachers and experts (KontentEdge, 2018). MOOCs, which are routed through MHRD, offer certification directly or through the participating institution.

Effectiveness, efficiency and quality

Communication is effective if the message reaches the audience in the intended way. The message may be simple or complex. Transmission of a message may use audio-visual material and invest in time for better effectiveness. The use of visuals is good. Efficiency is output in relation to input. It is getting maximum benefit out of inputs such as audio-visual material, time, money and teachers. Efficiency also means how effectively the sender is able to encode the message and the receiver decodes the message. Barriers to communication must be overcome/minimized and optimal resources used to achieve efficiency.

Quality is another variable altogether. It need not always be the case that a quality teaching material will be effective. NPTEL e-content may not be effective with non-IIT engineering students unless there is some sort of facilitation to bridge the knowledge gap. The teacher has to pitch to the level of the learner. Thus, sometimes under some circumstance, even a teacher who is not world class will be effective for a particular set of learners.

Figure 3: **Edgar Dale's Cone of Experience**
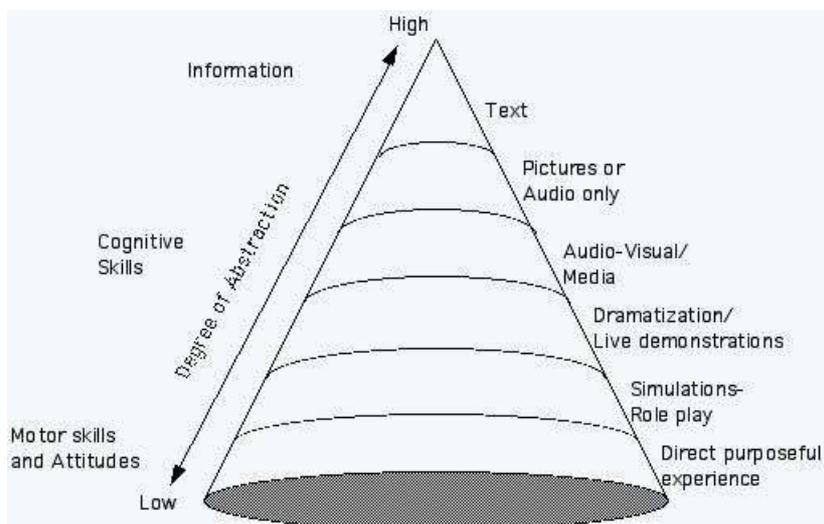
The Cone of Experience was developed by Edgar Dale in 1946 and had been modified by several scholars. It describes various learning experiences. It shows the progression of experiences from the most concrete (at the bottom) to the most abstract (at the top). Dale did not intend the Cone to depict a value judgment of experiences. He did not argue that more concrete experiences were better than more abstract ones. But this was the common interpretation being given. Dale believed that any and all of the approaches could and should be used, depending on the needs of the learner (Dale, 1955). This exactly is employed in personalized e-learning courses. "Reading and listening" need not be less valuable learning experiences compared to "doing the real thing". The assumption is that if more senses are used, the greater is the ability to learn from the experience.

In multisensory communication, each sense complements the other. For instance, audio-visual material is generally more effective than audio and visual material separately. The retention and retrieval of information improve with use of more senses. We often project "direct purposeful experience" as being superior to a talk or a printed text. But it can be argued that for higher education, the Cone of Experience may be inverted upside down at times, as the "reading and listening" are often considered very effective! Nevertheless, the younger generation who are 'digital natives' use smartphones for even reading and listening!

Students of today have grown up online and will expect the same in their learning environment too. They want round-the-clock access to the network and resources, on or off campus. Rigid modes of classroom teaching are unlikely to interest them. We need to keep pace. We also should be willing to adopt technology in new ways. Limited or no access to technology will result in a digital divide as well. Success would be compromised by lack of digital proficiency. For instance, the ability to connect with outside teachers with other universities could increase their knowledge base drastically. Whether online, blended or flipped, students and teachers no longer have to travel across for every single interaction.

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