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Research paper

Information & Communication Technology: A Road to Hybrid Teaching & Learning Pedagogy

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Abstract

Nothing is permanent except change, and the past generations of human being are the evidence of this fact. Change is done for betterment of the life and for the same reason Information and Communication Technology (ICT) has evolved and entered in almost in every sector with a variety of applications. One of the most important applications of ICT is in the field of education and training, where a large number of individuals can leverage the benefits of ICT to get quality education. The main aim of this paper is to realize the need of hybrid learning methodology in current educational settings. In this paper a novel approach for hybrid teaching and learning has been presented and explained with respect to its various components.

Keywords: *ICT, Hybrid, Teaching Pedagogy*

1. Introduction

The communication technology has changed rapidly from traditional postage system to e-transfer of information everywhere. The use of Information and Communication Technology (ICT) [1] has ease the dissemination of information around the globe irrespective of geographical boundaries and area of application. ICT has revolutionized the way of communicating information between two or more parties because it takes less time and is user friendly. In today's era ICT is being used in many areas including teaching & learning, banking, business, agriculture, medical, surveillance, transportation and many more. As per ITU World Telecommunication report 2017 [2], 48 persons out of 100 are using the Internet and 103.5 cellular connections are being used over hundred individuals. Fig 1 highlights the growth of Internet usage and mobile subscriptions by the inhabitants around the globe [2].

During the past decade the Internet and mobile users have increased by a huge amount, therefore the Internet and mobile technology can be utilized to provide many services to the end users. Education and training is one of the most important aspects of any state or country. Imparting quality education to large number of individuals is now achievable by harnessing the power of ICT.

2. Organization of the Paper

The paper has been organized under three sections. The first section of this paper elaborates the term ICT and analyze it as education enhancer due to its invaluable features. The next section of the paper compares the traditional teaching methodology with the new online learning approach. In this section it has also been highlighted that solely one approach for teaching and learning will not be effective.

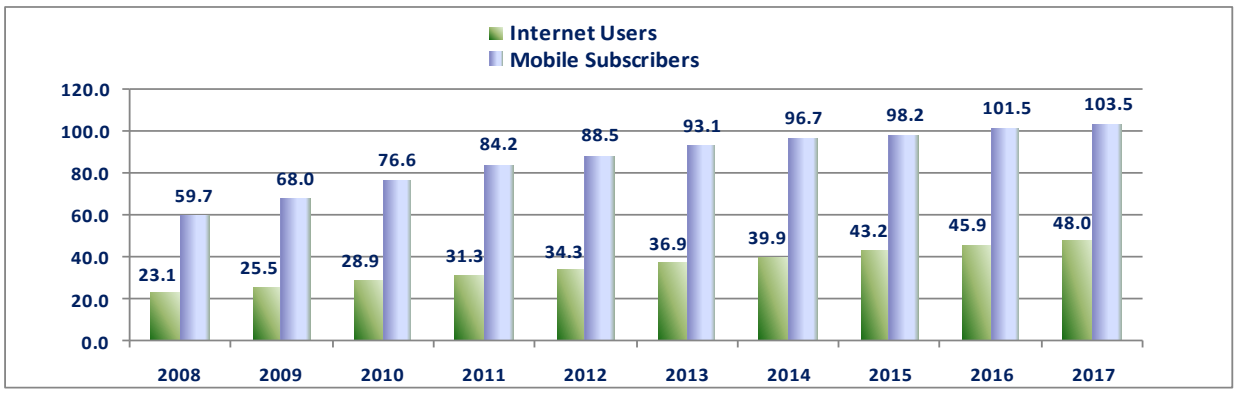

Fig. 1: Internet Users and Mobile Subscriptions in th Last Decade (per 100) – ITU World Tel

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The last section a novel approach for Hybrid Teaching and Learning Pedagogy has been proposed by coalescing the benefits of traditional face to face teaching and online learning. It has been stressed that in today's era the proposed hybrid pedagogy is suitable to provide quality education to mass of individuals. The outcome of each component of the proposed hybrid pedagogy has also been discussed.

3. ICT as Education Enhancer

Education is the foundation of any society, state or country. Imparting effective education to every citizen should be the primary objective of any country. ICT is one of the emerging concepts to enhance the education system including teaching, research and academic administration. ICT is the amalgamation of two very important building blocks of information transfer i.e. the processed data also called information and the technology used for communication. ICT is revolutionizing the delivery of educational content at all levels of education starting from primary to higher education. S. V. Raju et.al. [15] have pointed out that ICT tools in education leads to outcome based education (OBE) which mainly focuses on abilities acquired by the learners. In today's age ICT is continuously enhancing the delivery of education in both quantity and quality and the same is evident from the following features of ICT.

3.1 Anywhere Anytime Learning

The main feather in the hat of ICT is that it provides flexibility to the learners (24/7 availability) so that learners can learn anywhere anytime [5].

3.2 Innovative Teaching & Learning

Besides traditional blackboard teaching methodology ICT has opened many doors to implement innovative teaching styles like flipped classroom, audios & videos based lectures and many more which on the other hand is helpful in improving the retention memory of the learners. ICT works on the principle, "the things that are seen and heard together lasts for a long time in the memory."

3.3 Increases Literacy Rate

With the technological advancements and availability of educational content anytime one can make the most of ICT to get knowledge. Furthermore using the MOOC programs a huge number of individuals can be educated and trained simultaneously.

3.4 Enables Sustainable Development

ICT provides the skills and values for sound and sustainable development of individuals [4].

3.5 Reduces Complexity

With the use of ICT teachers can effortlessly elucidate difficult and complex content and therefore ensure students' understanding of the concepts. Teachers can also to build interactive sessions and make the teaching & training more enjoyable, which could improve learners attendance and concentration [11].

3.6 Offers Updated Quality Content

ICT is a source through which the latest knowledge and updates are disseminated to the mass [16]. The material is developed by the experts and researchers which meets the requirement of high quality education. Using ICT latest educational content can be provided to the learners.

In view of the features of ICT discussed above we can deduce that now ICT has become education booster and today it has become extremely important to integrate ICT with the traditional teaching methods.

4. Teaching & Learning – Conventional vs Online

Since the evolution the man has been using different ways to communicate his ideas. He first uses sounds to communicate, then he started scribbling on the walls and leaves to express himself and with the development of his mind he moved into the modern era where a proper language and codes have been invented to channelize the transfer of information. Now in the post modern era/ digital era technology is paving the new path for innovation and ideation. The difference between the conventional and online teaching can analyzed from the Fig 2.

In conventional teaching and learning, the approach is teacher centric, the teacher has to provide information in the allocated time and very less opportunity is given to the student and teacher for proper discussion on the topic. The teacher mindset is to inject the content into the brain of the students irrespective of the understanding the concept.

On the other hand, the online learning is considered far better than the conventional as the learner was given a proper time to understand the concept and according to his own pace and he was not forced to study in only limited time. It is student centric and reduce the stress among students as the learning is without pressure and countless opportunities like discussion forum, live chat with the instructors are there with the students to clear the doubts. But at the same time it has limitations like it is mandatory for the learner to have internet facility and proper speed to learn without any interruptions. V. Homiakova et.al. [12] have highlighted the advantages of ICT like less cost and 24/7 availability.

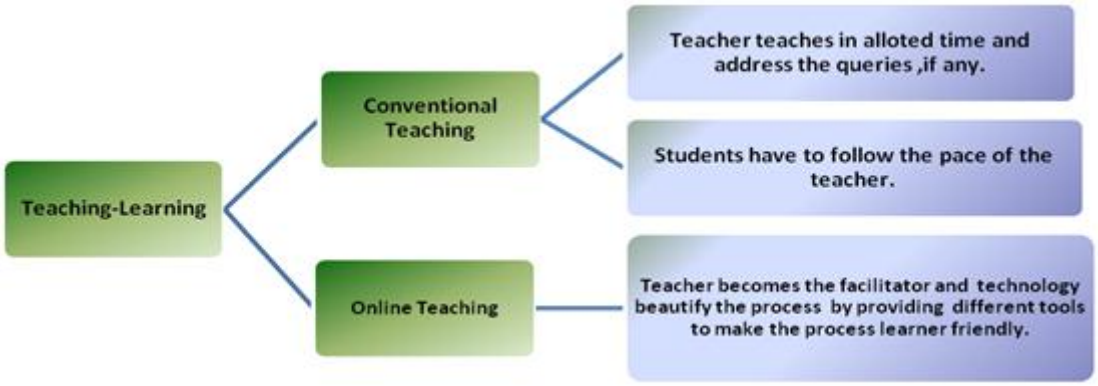

Fig. 2: Conventional Teaching vs Online Learning

Table 1: Comparison of Conventional Teaching and Online Learning

S. No.	Evaluation Parameter	Conventional Teaching	Online Learning
1.	Learning Pace	Rigid & Not Flexible	Flexible & Learner oriented
2.	Level of Interaction	Very less (One to many delivery)	Maximium (Many ways of interaction)
3.	Dissemination of content	Limited	Flexible(As per requirement)
4.	Availability	Limited (Only as per schedule)	Flexible (Anywhere, Anytime)
5.	Cost of Implementation	Recurring	Non-Recurring
6.	Bonding between learner and Teacher	Possibility of lifetime bonding	Missing(Interaction with the content only)
7.	Mentoring & Guidance	Can be provided	Cannot be provided
8.	Evaluation Process	Laborious & Time consuming	Easy &Quick
9.	Stress Level of Learner	More	Less
10.	Ethics & Values	Integrated with learning	Missing

The comparison of Conventional Teaching and Online Learning with respect to certain parameters including learning pace, interaction level, availability, cost, content, evaluation etc has been shown in the Table 1.

As per the analysis done in the table 1, one cannot only embrace conventional or online learning method in the changing global environment where daily new inventions and discoveries are made, without leaving values and ethics. Therefore, a hybrid teaching and learning pedagogy is required which leverages the benefits of technological advancements and at the same time preserves the culture, ethics, values of the society at large.

5. A Novel Approach for Hybrid Teaching & Learning Pedagogy

Hybrid teaching and learning [8] is now being considered far better than solely conventional and online teaching and learning. In Hybrid pedagogy a portion of time is devoted for online exploration of the content that helps in-depth comprehension of the concepts and theories [3]. To endow with the best teaching and learning a hybrid teaching pedagogy which integrates face to face teaching and online learning involving the ingredients or features mentioned in Figure 2 are required. These features have been briefly described below.



Fig. 3: Ingredients of Hybrid Teaching Pedagogy

5.1 Face to Face Teaching

Learning is incomplete without a teacher as the teacher not only delivers the content of the specific subject but at the same time he/she also acts as a mentor and guide who instills necessary ethics and values into his/her students. And thus face to face learning is very important component of hybrid teaching pedagogy.

5.2 Online Learning

One of the aims of hybrid learning pedagogy is to make use of the technological advancements at maximum. Different tools for implementation of online content delivery can be used to make the educational content available anywhere anytime to the learners. This gives flexibility to the learners in studying and understanding the content.

5.3 Learning by Activities

Teaching theory makes the learning monotonous. Teacher must adopt the activity based approach to intensively involve the learn ers. There should be proper assimilation of online content and in-class activities as per the syllabus.

Table 2: Potential Outcome of each Ingredient of Hybrid Teaching Pedagogy

S.No.	Ingredient of Hybrid Teaching Pedagogy	Potential Outcome
1	Face to Face Teaching	Mentoring, Guidance, Psychological Support
2	Online Learning	Flexibility in Learning (Anywhere Anytime)
3	Learning by Activities	Intensive Involvement of the Learners
4	Additional Learning Resources	Greater Understanding of the Learners
5	Peer Learning	Learning Without any Glitch Deviation
6	Multiple Teaching Methods	Seamless Opportunities to the Learners
7	Self Exploration	Build the Confidence in the Learners

5.4 Additional Learning Resources

Facilitator, in order to make the concept clearer, provides some advance texts, videos as a food for thought in order to help the learners to dive deep into the concept. Assimilation quizzes, progress check, projects, assignments should be a part of the pedagogy to check the understanding of the learners.

5.5 Peer Learning

As hybrid teaching takes care of the learners at all levels. Some students actively participate in the class activities like group discussion, presentations etc but due to some stress, shyness or hesitation some may not be very comfortable and active in the class activities. It is one of the most important aspects of hybrid learning as it provides a discussion forum to discuss the points with his co- learners without any glitch deviating from the track.

5.6 Multiple Teaching Methods

In addition to face to face learning hybrid learning uses seamless innovative teaching methodologies [6] including flipped classroom, case based learning, cooperative learning, problem based learning, just in time teaching and many more. This will provide

unlimited options and opportunities to the learners as per their interest.

5.7 Self Exploration

In addition to the content according to the syllabus of the course being taught some useful extra resources related to the course may also be provided by the teacher to the learner which facilitates the learners to explore more about the course by their own. This will increase their way of understanding and build the confidence.
Since the hybrid learning approach is more learner centered it is important to analyze the ingredients of hybrid teaching pedagogy from learners' perspective, and therefore in Table 2 the potential outcome of each ingredient of hybrid teaching pedagogy is shown.
In today's rapidly changing learning environment outcome based education has utmost importance for nation building. The learning content being delivered must be directly or indirectly related to either employability or entrepreneurship. From Table 2 the novelty of the discussed hybrid pedagogy for teaching and learning is evident as each ingredient of this pedagogy is leading to some outcome necessary to meet the objectives of education and training.
In the current educational environment it has become necessary to adopt the hybrid learning methodology discussed above. The hybrid teaching and learning pedagogy is the novel approach to impart quality education at every level starting from schools to universities. Any teacher or facilitator using hybrid learning approach must keep a balance in the content being delivered online and face to face. Ideally fifty percent content should be delivered face to face and the same amount should be put online in multiple ways including notes, videos, assignment etc.

6. Conclusion

In view of the need to provide quality education to the mass learners, hybrid teaching and learning method can be kept above the traditional and online methods, as hybrid approach to learning combines the advantages of face to face teaching as well as online delivery of educational content. The comparison of traditional teaching methodology and the new online learning has been made first in the paper and based on this comparison, a hybrid methodology which fulfills the demand of academics and society and helps in the holistic development of the learners, has been proposed. It has also been stressed that today there is a need of imparting outcome based education which can effectively transform the learners of today into professionals of tomorrow. The approach presented in the paper fulfills the above requirements and hence is the best suitable way to impart education for sustainable development of the individual. The concept presented in this paper has a great significance to the teachers, students and researchers involved in the study or implementation of ICT in education.

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