IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY
INNOVATIVE PROPOSED MODEL FOR EFFECTIVE TEACHING AND LEARNING PROCESS FOR HIGHER EDUCATION

Girish SR[*1] **& Dr C Suresh Kumar**[2]
[*1]Research Scholar, SHRI JJT University, Rajasthan, India
[2]Principal, Nagarathinam College of Engineering, Tamil Nadu, India

ABSTRACT
The 21st century era which is currently progressive, technology is showing its exploration and impact in all sectors, majorly in Educational field. Which is going through lot of adaptable updating changes particularly includes teaching and learning view. Then Information Communication Technology (ICT) plays a vital role, but on the other side if we only focus on the technological part we will not succeed because of infrastructural reasons on other extreme side we cannot leave the technology because it will lead to social outcast. Beside all we must accept by the fact that Higher Education system changed a lot. Where there is opportunity for showcasing valuable modification, or coming up with new innovative idea which will have more positive consequence and produce efficient result in the education system. By simple heuristic evaluation, majority of the students and professionals agrees that Information Communication Technology (ICT) in fact is very efficient for those who have several constraints to learn. Several course materials and available practices will be easily shared via ICT, this paved way for new pedagogy in teaching and learning methodology.

We have attempted to elaborate the complete emphasis of ICT for future changes, the major important subject/ matter is the current education system/program and the proposed model is based on the following concepts like self-motivating, self-learning, risk handling, innovative thoughts and self-justice. Because of active participation of students, higher learning institutions could increase the competency which produces nectar graduates who can face the employer's with at most confidence.

KEYWORDS: Higher Education, ICT, Pedagogy, self-motivating, self-learning, risk handling, innovative thoughts, self-justice.

I.   INTRODUCTION
ICT introduction in the Higher Education has an immense effect on complete education process varying from capital (Venture) investment to use of skill oriented technologies in dealing with vital issues of access, equity, administration, competence, pedagogy, quality, exploration and innovation. [2] The implementation of ICT applications in the institutions provide a viable edge which offers out of the box services to students and faculty which will lead to greater potential by opening new doors for refreshing learning experience.

Essential learning for futuristic view is significant than the knowledge based learning at traditional institutions. By arrival of ICT in education field it's mandatory to focus on contemporary pedagogy paradigm of teaching and learning process, where practical learning chances or more for learner. According to researchers, any beneficial positive oriented result from this idea will lead to key change in the teaching and learning process.

This varied change of using ICT for in classroom will boost the student to take accountability on his own learning and increases the inquiring based learning capacity. It's essential to impart the ability to use technology as the instrument to research, unify, gauge and communicate the information which will lead to basic understanding of the issues related ethically and legality for the use of information. [3] Communication, knowledge of connecting and fetching technologies is trending passion currently.

Teacher plays a vital role in maintaining the quality control, material upgradation and finding the effective learning process for the class. Teacher responsibility will not end at transmitting the information to students rather he must act as a professional or mentor in provoking the learning ability in students. [4]

II.   INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)

Information & Communications Technology (ICT) is segregation of technological tools which helps in the way we learn, communicate and interpret. [1]

Educational ICT tools divided into 3 categories
Input source, Output source and Others.

Input Source: Personal Computer, Application Software, Student Response System, Tablet or Slate, Visualizer etc.

Output Source: Monitor (Computer Display), Projector and interactive white board.
Other Sources are Camera, Digital Recorder etc.

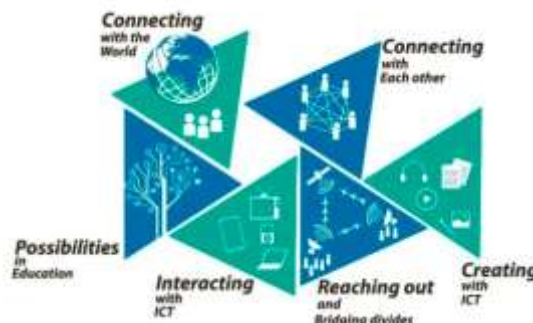Below figure depicts the ICT integration

Fig 2: Integration of ICT in Education [11]

III.   ROLE OF TECHNOLOGY

Due to the intervention of technology in the educational field many reports from different organization including UNESCO determined that there must be major basic change in the learning process. Present day has varied innovations and interest it's obligatory to have a new andragogy and this need new framework for teaching.
A renowned psychologist Howard Gardner, (1997) states: There is no limited boundaries for learning apart from what knowledge you got from classroom. Implementation of the technology while learning the concepts is a fascinating and outstanding experience which will make learner mad towards learning new concepts in innovative way. This will benefit the different level of society for educational development.

Since there is different objective view of everyone in the globe its always better feed complete conceptual knowledge which will include technology pertaining to it and related project work which will make them adopt and compatible with teaching system. [5]
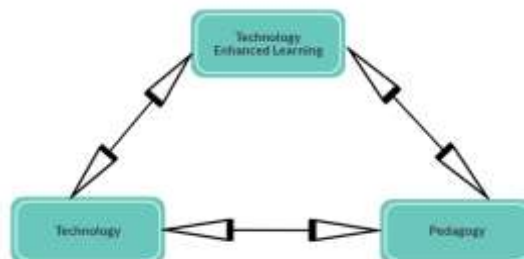

Fig 1: Technology Enhanced Learning [7]

IV. DIFFERENT LEARNING STYLES

Learning style includes two phases as mentioned Reception which involves various sense organs to gather information and Processing information received will happen through memorization, orientation and contemplation.

Active:
- ➔ Learn through actions
- ➔ Prefer to work in groups

Reflective:
- ➔ Think on the observation
- ➔ Prefer to work alone or in Pairs

Visual:
- ➔ Learns through pictures (Flowchart, Graphs, Images, Videos etc.)

Verbal:
- ➔ Learn through discussion
- ➔ Loud reading

Sensing: [6]
- ➔ Physical sensation (Touch, Smell taste etc)

Table 1. Learning styles [3]

			Characteristic's		
1	Accommodating	Diverging	Converging	Assimilating	
2	Activists	Reflectors	Theorists	Pragmatists	
3	Environmental	Emotional	Sociological	Physiological	Psychological
4	Active / Reflective	Visual / Verbal	Sensing / Intuitive	Sequential / Global	
5	Visual	Auditory	Kinesthetic		

1- *David Kolb's LMS, 2-Peter Honey and Alan Momford's LMS, 3-Dunn and Dunn LMS, 4-Felder-Silverman LMS, 5-Felder-Silverman LMS*

V. RELATED STUDY

There are many instructional design models which is designed and developed by using various design models. Few of them are discussed below

1. ADDIE Model

This model is developed by Florida State University. It has five phase Analysis, Design, Develop, Implement and Evaluate. This method uses is iterative approach for instructional design and commonly used instructional design model. [8]

2. The Kemp Model

Developed by Jerold Kemp, this adopts circular structure with nine core elements which are interdependent and suits for desired learning concepts with best results. [8]

3. Dick & Carey Model

In 1978 Walter Dick and Lou Carey developed this model. It resembles like ADDIE. Instruction act has a key to entire system focusing on the interrelationship between context, learning and instruction. [9]

4. Rapid Prototype Model

In this model prototype design is based on the outcome of the instructional design analysis. The instructor has complete freedom to choose the matching prototype based on the findings or analysis. [4]

5. Multimedia Design Model

Developed by Thomas Reeve and adopts linear Waterfall model for development includes four major functions Analysis, Design, Development and Implementation. [10]

Apart from the above-mentioned model there are many other instructional models. Out of all these few of the model has application designs with these instructional designs. Out of which many found to be futile or not used.

Choosing and incorporating the wrong choice of instructional delivery model for teaching and learning process is vital reason of failure.

VI. PROPOSED MODEL

Integration of ICT is required in Higher Education as per the Cross and Adam (2007), based on below four grounds. [12]

1. **Social** - Technological skills is mandatory for students in current digital age, hence students should be habituated with technology.
2. **Vocational**- We must train the students to get jobs that requires latest technological skills.
3. **Pedagogical**- Must modify curriculum delivery in an innovated way by using technology.
4. **Catalytic**- requirement of beneficial technology which improves and optimizes the overall outcome in teaching and other activities.

The new model proposed in this paper is by considering the impact of both technology and visual learning. Visual learning is considered as one of the most effective method of teaching and learning process. Out of which multimedia is one of the most effective way in delivering effective visual medium learning. Effective pedagogy happens when educational resources are delivered in a multiple presentation. But in many cases the educational resources will not include multimedia too. The students/learners will be eager to see real time example for the better understanding of the subject. There are many concepts in computer science which require the real-time simulation and multimedia content to understand the concepts effectively. This model is based on the real-time content delivery of the concept or subject, which will give the multiple options to the student to understand the subject/concept.

This is a student-centered model, where there is choice for the student to opt the type of reading content which he prefers to understand the concept effectively in sequential way from different resources in a limited time. which consists of the various multimedia contents

Knowledge Base
It is a repository where the facilitator will feed/load the academic curriculum/syllabus related to a subject.

Exploration Tool
Here the entire process and filtration will happen based on the subject selected. After complete process, it will show provide the multimedia contents to the student related to selected topic. The multimedia content will consist of the following (Books, Research papers, Videos, Audio tapes, Infographics, blogs, gamification, mobile apps info etc.) to understand the concepts.

And all these multimedia content will be available to the student based on frequent top-rated links, videos and latest research papers. Infographics will be available in a pictorial representation which will give complete information.

Gamification is available for specific topics which will make student to play the game which is developed based on the topic. Through the game they will achieve good skills so it is very easy to get well educated knowledge. [13]

Since the student have the choice to opt the content and start understanding the concepts from various type of resources. Which will increase and provoke the passion of student to understand the concepts in a better way. The student-centered learning model has multiple advantages which is listed below
- Problem Solving
- Creative Learning
- Integrated Learning
- Independent Learning
- Collaborative Learning
- Evaluating Learning [13]

Access Interface
Provides an integrated interface through which Facilitator can provide the access details to students which helps to validate the security integrity to the web application. The administrators of academic institutions can access, upload or modify the data with defined authority.
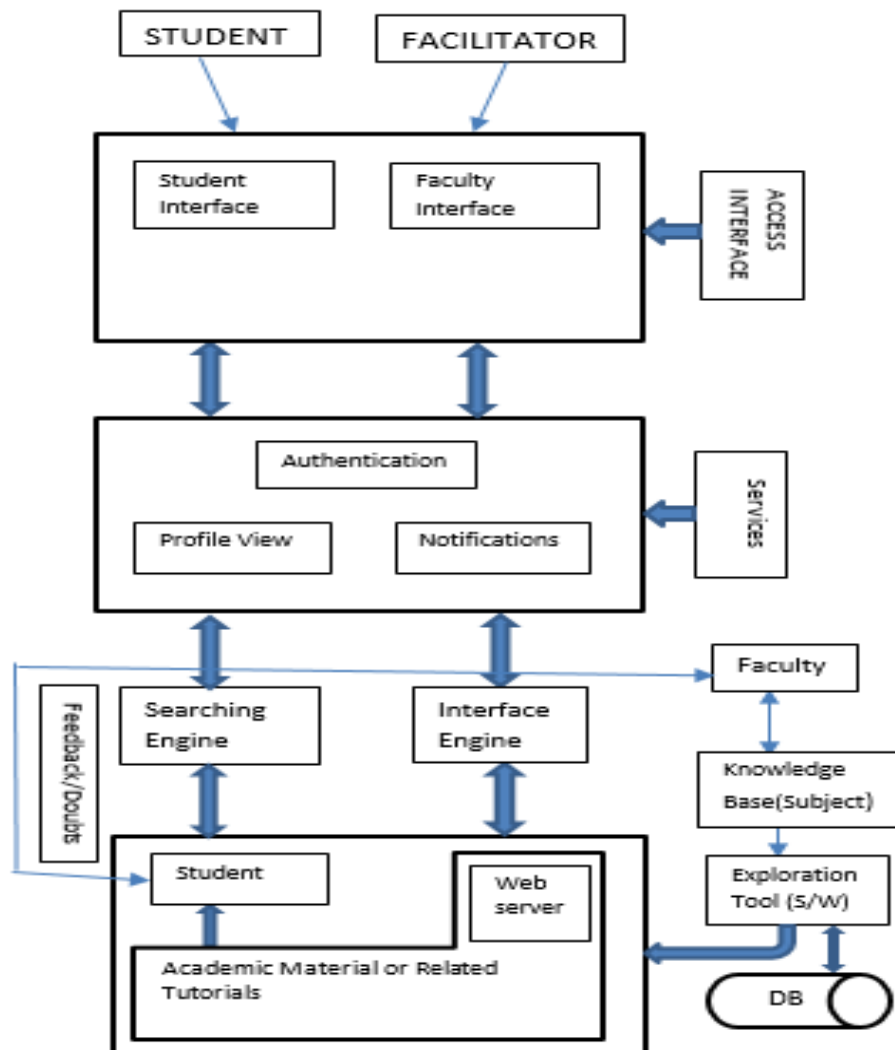

Fig 3: Conceptual Architecture for Teaching and Learning Model

The proposed design model is a blue print for new model for teaching and learning process. In the proposed model, the faculty can feed the academic curriculum to the knowledge base which will go to an intelligent "Exploration Tool" where the entire multimedia content will be developed based on the Curriculum/syllabus topic.

VII.   TECHNOLOGY STACK

The exploration tool is web based application which is hosted on AWS cloud platform. Since cloud has variety of unique features.

Since this is a web based application the application server hosted on Linux environment, student can access this site through Chrome or Mozilla for windows OS and Safari for Mac OS users. Application server hosted on Elastic Compute Cloud (EC2) and Exploration tool consist of Business Logic which is connected to Amazon DB service called Dynamo DB. This entire infrastructure is hosted in AWS Cloud.

Here Faculty plays a vital role in searching, innovating, creating of content, segregating the information from various authorized source. With all these docs faculty will prepare student friendly content where all the

multimedia content is encapsulated. The faculty will push this encapsulated data to the exploration tool by mapping accordingly based on the topic. Each content will be arranged based on the concept mapping to the student. When student search the topic in that subject the mapped content will be delivered to the student.

After going through this material student can ask doubts by posting in the portal where faculty can view it and provide the feedback. Based on the feedback faculty can validate. Based on the feasibility faculty has independence to implement or adopt it. Since it is not an iterative model the student can jump from one multimedia to other to understand the concept.

Since the tool will provide the Video and Audio tape of requested topic it has more impact on the student. As many research shows visual has more impact and 88% of the human brain will capture the visual content more significantly. [14]

This model has two advantages, primarily it will generate the required curriculum based mapped multimedia content by faculty with the help of exploration tool. Secondly it will also allow facilitator to modify the content based on curriculum change or based on the feedback from the students and load to exploration tool which will deliver to the student. Faculty also get the complete analytic report of entire class based on which student has completed the module pertaining to topic.
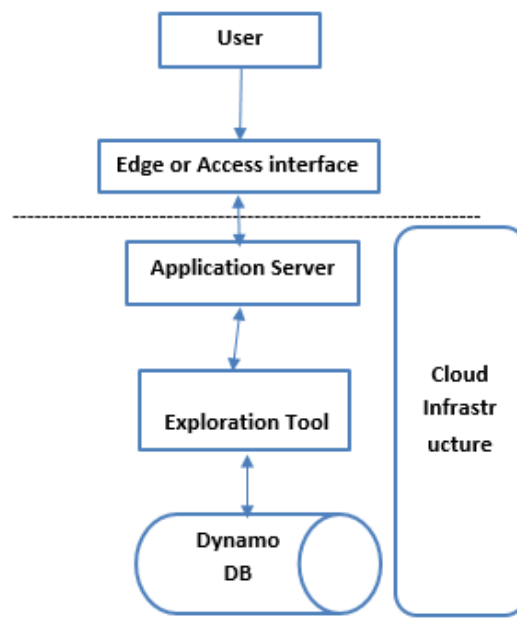

Fig 4: Technical View Of Conceptual Model

VIII. CONCLUSION

Current teaching methodology is not concentrated on student centric methodology it was partial one-way communication within facilitator and student. Student involvement is very less and he was not getting the conceptual and practical understanding of the subject. Rather it was theoretical oriented without any involvement of student. The proposed model will have more effective impact on the student, it will make a clear way in enhancing his knowledge and skills. The content generated by exploration tool will provoke the student mindset toward the research. Pictorial and video content helps student to understand the concept more clearly. It will act has a guide agent towards enhancing his knowledge skills using the new generation web, cloud and ICT.

IX. REFERENCES

[1] Shabnam Bidarian, soheila Bidarian , Amirhosein Mohammad Davoudi. A Model for application of ICT in the process of teaching and learning.
[2] Dr. Md. Mahmood Alam, Use of ICT in Higher Education, The International Journal of Indian Psychology ISSN 2348-5396 (e) | ISSN: 2349-3429 (p)

[3] V. V. Krishna, "Universities and emerging national innovation systems," South Asian (Indian) Experience. 2007.

[4] K. Balasubramanian, Willie Clarke-kah, "ICTs for higher education. Background paper from the common wealth of learning UNESCO," World Conference on Higher Education Paris, 2009.

[5] Van Brakel, P. A., & Chisenga, J. (2003). Impact of ICT-based distance learning: the African story. The Electronic Library,21(5): 476-486

[6] Jung, C.G. (1971). Psychological Types, Princeton University Press, Princeton, N.J. (Originally Published in 1921).

[7] Béres Ilona, Kis Márta, Licskó Ildikó, Magyar Tímea Dept. Methodology Budapest College of Communication and Business (BCCB) Budapest, Hungary iberes@bkf.hu, mkis@bkf.hu, ilicsko@bkf.hu, tmagyar@bkf.hu, Technological Support of Web based Project Work in Higher Education.

[8] Instructional Design available at www.wikipedia.org/wiki/instructional_design.

[9] Instructional Design available at https://en.wikipedia.org/wiki/Instructional_design#cite_note-Forest-54

[10] Reeves Multimedia Model available at http://edutechwiki.unige.ch/en/Reeves_multimedia_design_model

[11] ICT collaboration and integration in education http://ictcurriculum.gov.in/

[12] Cross, M. & Adam, F. (2007). ICT Policies andStrategies in Higher Education in South Africa: National and Institutional Pathways', Higher Education Policy 20(1), 73–95.

[13] Kai Erenli. The Impact of Gamification A Recommendation of scenario for education. 15th International Conference on; Interactive Collaborative Learning (ICL); 2012 Sept. Available from https://www.researchgate.net/publication/261313934_The_impact_of_gamification_A_recommendation_of_scenarios_for_education and Crossref

[14] The role of ICT in higher education for the 21st century: ICT as a change agent for education Ron Oliver.

CITE AN ARTICLE

SR, G., & Kumar, C. S. INNOVATIVE PROPOSED MODEL FOR EFFECTIVE TEACHING AND LEARNING PROCESS FOR HIGHER EDUCATION. *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY, 7*(1), 47-53.