A Comprehensive Study On Learning Styles, E Learning Model And Tools

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Abstract: The advent of internet has revolutionized each and every aspects of day today living, it has also influenced the Teaching and Learning process. The traditional class room teaching is being steadily replaced by the E-Learning Platforms, with the arrival of Mass Learning platforms like MOOCs is changing the dimensions of the Learning pedagogy. The concept of e-Learning is resting heavily upon the Learner Centric E-Learning models and is relied upon the E-Learning Styles; they are also influenced by the underlying E-Learning architecture. In this paper, an attempt has been made to categorize survey and synthesize the Learning Styles, E-Learning models and their Architecture.

Keywords: Learning Styles, E-Learning, E-Learning Model, E-Learning Architecture, E-Learning Tools

1. learning

Every day in our life use the term 'learning'. The definition of learning would be varying based on person to person [6]. Learning is the process of acquiring knowledge or skill through study, experience, or being taught [1]. In another words Learning is the process of transforming the information and experience into knowledge, skills, behaviors, and attitudes [5]. Basically learning is fall in to the following categories:
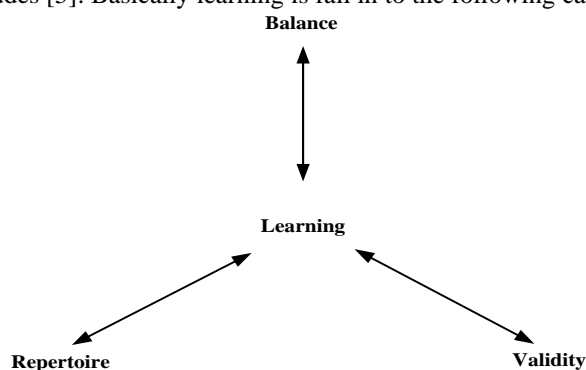

Fig. 1 Learning Categories

Balance – Learning experience to satisfied expectation of all the learners
Repertoire – Use different pedagogical ways for learning
Validity – Assess the knowledge or skills of the learner

2. Learning styles

a) 4MAT Learning Style Model
The 4MAT learning model, training assessments and training programs create a common language for designing, engaging and effective learning [7]. 4MAT teaches how to identify learning styles and engage every learner to produce focused, measurable impact in your real-world training content [8].
Characteristics
- Innovative/Imaginative Learners
- Analytic Learners
- Common Sense Learners
- Dynamic Learners
b) Gregorc Mind Styles Model
In 1984 Anthony F. Gregorc developed a model called Mind Styles in which he proposed that perceptual and thinking leads to preferred learning characterized by Abstract Random, Abstract Sequential, Concrete Sequential and Concrete Random [7].

c) Kolb Learning Style Model

According to Kolb the learning takes place in the process of acquiring the abstract concepts in a flexible situation [7]. In his theory, he stated the new experiences of learning are driven by following the four characteristics such as Diverging, Assimilating, Converging and Accommodating [9].

d) VARK Learning Preference

VARK learning style is the most common theory which was developed in the year1992. The proponent of this theory are Neil D. Fleming and Coleen E. Mills who said the learners are classified into four category, they are Visual Learners, Auditory Learners, Readers and Kinesthetic Learner [7].

e) Honey Mumford Learning Style

Peter Honey and Alan Mumford built up a theory based kolb's learning style and stated that the learners are sometimes called, Activist, Theorist, Pragmatist and Reflector [7].

f) Felder-Silverman Learning Style

He proposed that the personality influences one's learning style and viewed that the learning dimensions can be, Active or Reflective, Visual or Verbal, Sensing or Intuitive and Sequential or Global [7].

g) Herrmann's Brain Dominance Instrument (HBDI)

Herrmann fashioned a Brain Model Theory in which the thinking and learning take place in three process, they are; **i. Upper mode thinking process** that is divided into upper left where Logical, Analytical, fact based and Quantitative learning occur on the other hand Holistic, Intuitive, Integrating and Synthesizing learning happens in the upper right. **ii. Lower mode thinking process** which again divided into two, the learners who use lower left tend to exhibit the following characteristics, Organized, Sequential, Planned and Detailed, the learners who act upon the lower right brain are more Interpersonal, Feeling based, Kinesthetic and Emotional [7]

3. E learning

Now a day the traditional learning slightly moved to the Web Based Learning (WBL), which helps the learners to acquire their knowledge and skills in effective manner. Even though the way of the delivering method is changed, the objective of teaching and learning process remain same [5]. E – Learning refer as the electronic Learning, which means use of technology to connect tutors and learners who are physically miles apart and connected via various virtual platform such as google meet, google class room, webmax and the list goes on. The advantages of e-Learning are as follows:

- Resources in several varying formats.
- Promote web-based learning.
- Active and independent learning.
- Learning could be done 24/7.
- Use LMS tools for accessing and delivering course content.

4. Types of learning

The Learning can take place in two mode i.e
a)   Synchronous e-learning
b)   Asynchronous e-learning

a) Synchronous Mode – In this mode the instructor and the learner can interact virtually even being afar with live mode as that of real time class room learning. Hence the instructor can track the learning activities of the learner, can monitor, can be world widely connected however it is limited and the technology barrier can happen.

b) Asynchronous Mode – Here, the learning takes place without live interaction, the instructor allows the learner to learn at their own space by way uploading the content and assigning them to learn by themselves. This helps the learners to think out of box, being more analytical and creative. However the personal touch of the instructor will be lost.

5. E learning model

a) Demand-Driven Learning Model (MacDonald 2001) - The Demand Driven Learning Model describes the technology used in the Learning Management System, Quality of Content, Services and Delivery [9]. The table 1 listed below are some of the components of DDLM:

Component	Descriptions

Structure	• To fulfill the need of learners in term of content, knowledge and experiences. • To enhance the Teaching and Learning process by using technology and tools. • To provide collaborative (Tutors, Learners) and healthy learning environment. • To obtain program goals by providing proper curriculum structure. • Use appropriate pedagogical method in Teaching and Learning process. • Assessment of learners to be regular. • Learning activities is based on the learners convenient.
Learner Demands	• Content – The quality of material is based on Comprehensive, Authentic/industry-driven and researched. • Delivery – The delivery of content is based on Usability, Interactivity and Tools. • Service – The quality of services by providing resources, Administrative and technical support, Staff, Accessibility and Responsiveness.
Learner Outcomes	• Satisfied with the learning experience • Acquire new and relevant skills and knowledge • Apply the new knowledge and skills in their workplace
Evaluation	As researchers apply their knowledge of the DDLM to improve existing programs and guide the creation of new ones.
Adaptation and Improvement	WBL must then adapt in concert with this in order to ensure quality, progressive WBL. Through this continual adaptation and improvement of the DDLM, its longevity and validity as the standard for WBL will be ensured.

Table 1 Components of Demand-Driven Learning Model

b) Keller's ARCS Model - John Keller introduced the ARCS model (Keller, 1987) which helps learners to acquire the knowledge based on the motivation and characteristics of learners [9]. ARCS stand for Attention, Relevance, Confidence, and Satisfaction.

i. Attention

Incongruity and Conflict – Use contradiction

Concreteness – Use visual representations, story and graphics

Variability – Change - tone of voice, movements

Humor – Use story and jokes

Inquiry – Use problem solving and practical

Participation – Use games and simulations

ii. Relevance

Experience – Sharing previous experiences, ideas and skills

Present Worth – Spell out the value of teaching and learning

Future Usefulness – Mention the future of this learning

Need Matching – Give opportunity to learner's exhibit talents and achieve their goals Modeling – Show learners role models in the learning process

Choice – Allow learners to prefer their own method

iii. Confidence

Learning Requirements – Mention the goals and objectives

Self-growth – Give opportunity to learners

Provide Feedback – Tell the feedback about learner's improvements

iv. Satisfaction

Natural Consequences – Encourage learners to obtain new skills

Unexpected Rewards – Avoid boring tasks or use a surprise reward

Positive Outcomes – Recognize the achievements (praise, personal attention, motivation)

Avoidance of Negative Influences – Avoid using of threats

Scheduling – Maintain proper time interval in teaching learning process

c) Strategic e-Learning Model

The success of learning process is not only complete the courses, it's based on the how the learning process encourage and motivate the learners to acquire new things and skills. Based on this model the teaching and learning happen in the following process;

i.   Learn basic motivation

The four basic elements of motivation defined by John Keller, called as ARCS learning model which is helps the learners to increase motivation. They are,

- Attention
- Relevance
- Confidence
- Satisfaction

ii. Think structure

A well logically sequenced e-learning course materials will enhance the leaning and grasping capacity of the learner and help them to be more confident.

iii. To Increase visual interest

Visual elements such as Photography, Video, Graphics and Animation strengthens the visual learners.

iv. Incorporating Emotion

Inclusion of Emotive content in the class room such as fear, anger and love, etc… will make the session more interesting and attractive.

v. Tell a story

Story telling is the another method of making the class room very active, the instructor can use anecdotes, examples and narrative structure in their class room settings set up.

d) ADDIE Model

The Addie (Analyse, Design, Develop, Implement and Evaluate) concept in the preparation of course material and the instruction method will be more effective and will enhance the learning capacity of the students

e) 4 E Learning Cycle Model

This learning model assists the learners to improve their learning activities in the following ways:

i. Engage

This learning phase engaged the learners interest with help of classroom discussion or demonstration activity.

ii. Explore

Learners strengthen understanding of concepts, applies the concepts with the help of web and laboratory activities in class. Laboratory - simulation and assessment for laboratory procedures and analysis; Web – use LMS tool;

iii. Explain

The Explain phase is supported by Web-based tutorials, which make use of graphics, animation, and interactivity (like discussion) to teach key concepts in the learning process.

iv. Evaluate

This phase elicit to use of LMS tool for evaluation like assessment, feedback, tracking, and reporting, etc,.

6.   Proposed architecture of e learning

In the modern era, almost every learner uses the e-teaching and learning and platform. However, many researchers have concluded that the virtual platform never can replace the real time class room learning. E-learning Cloud is a joining together of cloud computing technology with field of E-learning [2]. Fig.2 portrays the E-learning architecture in the view cloud environment [3]. The layers of architecture are; Infrastructure layer, Software layer, Resource layer, Service layer, Application layer [4].

a.   **Infrastructure layer**

The components of this layer are software, hardware, internet, intranet, system software.

b.   **Software layer**

It is composed of operating system and middleware.

c.   **Resource layer**

The key to achieve loose coupling of software resources and hardware resources happen in this resource layer.
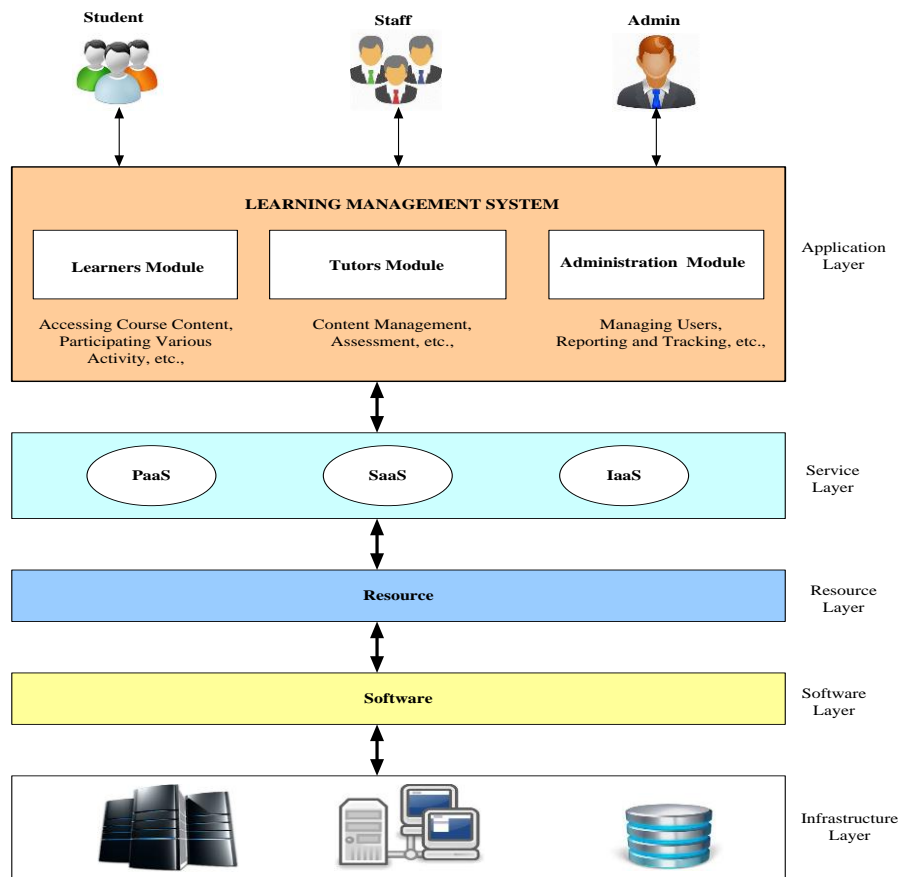
Fig. 2 Proposed Architecture of E Learning

d. **Service layer**

There are three service layer namely, SaaS (Software as a service), PaaS (Platform as a service), IaaS (Infrastructure as a service).

e. **Application layer**

The application layer is used to make the instructor too be interactive and make the classes more interesting. It is majorly focused on material preparation, course objectives, course outcome, delivery of the content assessment and management component.

7. E learning tools

The table 2 listed the E Learning tools.

S. No	Tool	URL	Language	Open Source
1	Moodle	https://moodle.org	PHP	Y
2	Docebo LMS	https://www.docebo.com/	PHP	N
3	Joomal LMS	https://www.joomlalms.com/	PHP	N
4	Sakai	https://www.sakaiproject.org	Java	N
5	Atutor	http://www.atutor.ca/	PHP	Y
6	Chamilo	https://chamilo.org/	PHP	Y
7	Blackboard Learn	https://www.blackboard.com	Java	N
8	Litmos	https://www.litmos.com/	.NET	Y
9	Talent LMS	https://www.talentlms.com	REST	N
10	ITS learning	https://www.itslearning.com	MATLAB and	N

			Python	
11	Webwork	webwork.maa.org	Java (Struts 2)	N
12	Totara LMS	https://www.totaralms.com/	PHP	Y
13	openOLAT	https://www.openolat.com	Java	N
14	XBlock	https://open.edx.org	Python2	N
15	slideWiki	https://slidewiki.eu	PHP	Y
16	Udemy	https://www.udemy.com	PHP	Y
17	Sclipo	https://www.crunchbase.com/organization/sclipo	PHP	Y
18	Elgg	https://elgg.org/	PHP	Y
19	Forma LMS	https://formalms.org/	PHP	Y
20	Dokeos	https://www.dokeos.com/	PHP	Y
21	IlIAS	https://www.ilias.de/	PHP	Y
22	opigno	https://www.opigno.org/en	PHP	Y

Table 2 E Learning Tools

8. Conclusion

Human being by nature tries to acquire knowledge all through his life and in this new era of online learning. The architecture that I proposed in this paper is an attempt to satisfy all kind of learners. In future I expect to proceed with research in this line and to come out with proposals that will satisfy needs of present age in the field of E-learning.

9. Abbreviations

MCOOCS:	Massive Open Online Courses
VARK:	Visual Learners, Auditory Learners, Readers and Kinesthetic Learner
HBDI:	Herrmann's Brain Dominance Instrument
WBL:	Web Based Learning
DDLM:	Demand-Driven Learning Model
ARCS:	Attention, Relevance, Confidence, and Satisfaction
ADDIE:	Analyse, Design, Develop, Implement and Evaluate
4 E:	Engage, Explore and Explain
LMS:	Learning Management System
SaaS:	Software as a service
PaaS:	Platform as a service
IaaS :	Infrastructure as a service
MOODLE:	Modular Object Oriented Dynamic Learning Environment

Availability of data and materials
   Not Applicable

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