Virtual Classroom in IT Services Industry: A Literature Perspective

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Abstract:Training plays a very vital role in business in this competitive world. This helps in improving the quality of tasks done by employees and also helps in organizational growth. In the 21st century, Information Technology (IT) is growing at a faster rate. The expectation from this industry is very high as technology plays a great role in the growth of the country. Virtual classroom is used IT industry to deliver the training for the to the employee working across the globe. The paper discusses the difference between traditional classroom and virtual classroom. Also, explains the virtual classroom environment with the stakeholders involved in the system. Virtual classroom training is very vital now for Indian IT services industry. The existing systems are not exploiting all the features and factors for effective virtual classroom. Also the paper identifies the gaps in the existing models.

Keywords:Virtual Training; Virtual classroom; IT industry; Training model.

I. INTRODUCTION

Virtual classrooms today are used by educators to replicate practices carried out for centuries in a typical classroom [1]. The use of networked computers to enhance learning was introduced as early as 1980, when Chambers [2] suggested that distance learning experiments should be implemented in a way that could enable in-house learning for some educational materials. Although the technology is available for virtual classrooms to move beyond traditional (face-to-face) educational settings [1,3] and to include practices that cannot be carried out in a traditional classroom, this is not the case and it will probably take some more years to become a widespread practice. This study is performed to understand the factors which impact the current virtual classroom an online learning environment [3, 4] system.

Due to rapid technological changes there is a need to improve the skills of employees based on current market demand. So, the training needs to be delivered in the right time with right content to the right audience by right instructors. The literature review recommends to adapt different models to conduct and evaluate the virtual trainings in IT industry. It also points out the different challenges to be managed with the different stakeholders. The existing literature does not have sufficient information on the model for virtual classroom conduction. Virtual environments become prevalent in all educational institutions and organizations but their effectiveness is not yet explored completely. This paper studies the existing systems and also trying to find out the gaps which exists in the current systems.

To present this case, the following section includes a brief literature review on training, training structure, virtual classroom in IT industry, section 3 presents the virtual learning environment from learner, teacher and institutions perspective, section 4 gives the gaps present in the existing studies, finally section 5 concludes the paper with summary and future research.

II. VIRTUAL CLASROOM FOR INDIAN IT INDUSTRY

Training plays a very vital role in business in this competitive world. This helps in improving the quality of tasks done by employees and also helps in organizational growth [5]. In the 21st century, information technology (IT) is growing at a faster rate. The expectation from this industry is very high as technology plays a great role in the growth of the country. To deal with this expectation, industry has to be very productive and innovative in building different services and products [6]. Organization's growth depends on the employee's skill and commitment [7]. It is very important that employee gains right knowledge and skill to meet the requirements of her job. Right skill at right time is possible based on right training [8]. This is required to handle the current needs as well as future challenges of the organization [9].

Training refers to transferring knowledge, skills and abilities [10] required to do a function or activity. Training is developing a specific skill based on that knowledge, whereas education is a specific learning condition. A number of innovative and influential theoretical frameworks for training have been developed since 1992. Also, a number of experimental studies have been carried out in the field of training based on those theories [11].

There are number of definitions of training by practitioners and academicians in the organizational space.

Definition 1:
A person in order to perform a given job effectively requires training. Training is the organized improvement of the attitudes/knowledge/skill behavior patterns of a person (Department of Employment, 1971).

Definition 2:
Training is structured activity designed at providing information to improve the participant's performance. (Business Dictionary).

Definition 3:
Public servant's knowledge, skills, attitude, behaviour, values, functioning and intellectual habits get improved by training to perform effectively a given job [12].

Definition 4:
Training is a strategic involvement aimed to improve the contributing factor of individual's job performance [13].

Definition 5:
Training is organized acquisition of the knowledge, skills and attitudes (KSA's) to perform a job effectively [14].

III. IMPORTANCE OF TRAINING STRUCTURE

One of the significant factor for the success of the training is its structure. The structure of the training need to be such that it creates interest in participants [15]. Also, the training needs of the organization is one of the input for the training structure. The interest of the individual and organization to be taken while preparing the structure. This will change their opinion about the training and also will motivate them to participate in the training. This also improves job satisfaction of employee and their working condition [16]. Organizations get skilled and capable employees as a return of investment of their training cost. This also helps to improve morale of employees.

Trainings can be on-the-job training and off-the-job training. Also, there are different modes of training i.e. classroom, virtual classroom, e-learning, video conference and virtual learning. But the e-learning and virtual trainingare becoming more dominant and replacing traditional learning due the time, cost and geographical

constraints of organizations. Major disadvantage of e-learning and recorded teaching methodology is offline training; Instructor will not be available for the participants to resolve their ad-hoc queries. However, the same can be resolved in virtual classroom, where Instructor will be available online for the participants to resolve their ad-hoc queries then and there. Models like Kirkpatrick Model, CIRO (Context, Input, Reaction and Output) Model, Jack Phillip Model etc. are used to measure training effectiveness on the different types of training. But still it is difficult to measure the absolute effectiveness of these training activities.

IV. VIRTUAL LEARNING ENVIRONMENT (VLE)

Employee's knowledge, skill and behavior is directly proportional to the effectiveness of the training in an organization. The expenses made on the design and execution of training is measured based on the employee knowledge gained and skill acquired [17]. The training needs to have right goals for the employees [15]. Some employees undergo the training program as they feel it is for their work, but some employees think it benefits the organization. Employee's interest and commitment for the training program is dependent on their perception. The growth and development in an organization depends on effective training [18,19]. Organizations provide training to their employees to get the fullest from them on their performance. Training provides the required skills, knowledge and abilities to the employee to do their job more efficiently.

The virtual learning environment (VLE) [20] is to be understood first before talking about the virtual classroom training. The different features present in the physical classroom and the features required in the virtual learning are to be identified first. Virtual learning environment can be referred as learning using technology There are a great amount of variance between VLE activities

considered in regard to the goals and causes of introduction to VLEs, the participants targeted, the technology chosen, the fundamental instructional arrangement, the scope of training. This property of VLE answers the questions like when, why and how to adopt and use VLE in organization and educational institute. More research needs to be done to define more clusters of related parameters in the learning context. Those clusters may be used in the implementation approach.

The requirements for VLE development within organization or institutions are:

(i) Fair understanding of different actors participating in the learning process. The actors are developers to administrators, instructors, participants etc. The role of instructor and technical staff requires a change for designing and using VLEs. Instructors have to obtain new knowledge and skills to become good facilitators and content designers etc. It is also very important for them to cope up with the fast changing technologies. The current experiences on VLEs gives anindicationofsignificant transformations in the jobs done by instructors.

(ii) A trans disciplinary approach to engage with different disciplines i.e. subject matter experts, system administrators and instructional designers etc.

(iii) The incorporation of socio-cultural elements with the VLE. The accessibility of VLEs in any time and any place is the solution to educational and training problems given to sell "educational technology". Networks learnings in organizations and higher educations are researched more on effectiveness of training. E-learning now plays a main role in the delivery of virtual learning in most of the organizations. Learning material and support is available via VLE to learners all the time [20].

The researches done gives different reasons for training effectiveness.

Table-1 describes different stakeholder's perspective about VLE.

Table 1**:**Different stakeholder's perspectives on VLE

Whose perspective?	In favor	Limitations
Learners	To gain knowledge in training due to flexibility. To join in collaborative learning process which is much better than a traditional one [20]. To able to share their issues for a given situation with other learners.	Lack of technical skills. Bad experience due to the new technologies[20].
Teachers	To get the better and new experience of teaching in a VLE [20]. To gain higher position by giving training in VLE [21]. To offer training to those learners who may not be able join a traditional physical classroom environment [20].	They feel that they do not have the necessary technical skills to facilitate learning through VLEs [20]. They are convinced that the best way to teach their discipline is through face to face teaching.
Institutions	They can promote the use of a particular language, Learning materials created in one language can often be converted for use by speakers of another language at relatively low cost. They can get subject matter experts (SME) from different cultures to provide unified learning experience.	it may not be feasible to use VLEs due to the improper technological infrastructure. They fear the it would be a great failure after so much of investment and well-publicity.

The pros and cons of VLE is described in the **Table 1** from learners, teachers and institutions perspectives. This can be shared in different educational institute and organizations. More research is required to know more "unknowns" and uncertainty in the VLE activities [20].

V. VIRTUAL CLASSROOM

Virtual classroom is an online mode of learning environment which provides all the features for delivering the training [25]. It contains all necessary for learning which are present in a physical classroom. Virtual classroom is delivered using web-based tools [25]. The learners are able to not only explore the facilities of internet to interact with instructor but also with other participants to create significant and productive learning environments [29]. Online tools used for virtual classroom have online assessments, chats, discussion forums and file transfers etc. Virtual classroom enables active learning environment which consists of tools, materials, and chances for discussion on a specific context with co-participants as well as instructor [22]. It moves learning to a higher level by providing active communication with the instructor. Instructors has the control of the entire process of learning and teaching. They can control the virtual classroom similar to the way they used to do in the traditional classroom [22].

Virtual classroom provides all the flexibility to interact with all the stakeholders of the training by stretching the latitudinal and time-based barriers.

Virtual Classroom training has below listed advantages:
- o Online and real time learning in the presence of instructor
- o Reduce travel time, infrastructure and communication costs
- o Provides a flexibility to learn with geographically apart participants from a subject matter expert
- o Reduces learning time as compared to offline pre-recorded sessions and e-learning

- o Deliver online training in a format that imitates a traditional classroom interaction
- o Provide facility to record training sessions for future use
- o Authorize employees to share knowledge with each other as subject experts

Table 2 shows comparative features of different modes of training along with traditional classroom [23]. It shows the features presents in different mode of course delivery.

Table 2: Comparative features of different types trainings

Features	E-learning	Classroom	Virtual classroom	Video conference
Participants need to be in one location	Not required	Required	Not required	Not required
Accessibility of SME during the course	Not required	Required	Required	Required
Fixed time for the training	No	Yes	Yes	Yes
Online interaction with educator possible	No	Yes	Yes	Yes
Online interaction among the participants	No	Yes	Yes	Yes
Re-usability of content	Possible	Not possible	Possible	Not possible
Internet connection for training	May/May not	Not required	Required	Required

VI. IMPORTANCE OF TRAINING FOR AN ORGANIZATION

Organizations invest in training activities to get motivated employees to drive the organization to become more competitive [24]. There are three goals for the training: i) helping employees to do better in their current job, ii) promoting employees at the time of job change and iii) helping employees to grow in their career. Training effectiveness in an organization can be measured based on change in employee's skill, behavioral and knowledge due to training program. There is a cost involved in the design and execution of training. That can be measured with all related benefits i.e. productivity due to improved skill and knowledge. The vision of training is to increase the job satisfaction and motivation to do better work [16] Organization with more employee friendly policies motivates employees to put their hundred percent efforts to take the organization to the next level.

VII. IMPORTANCE OF VIRTAUL TRAINING IN INDIAN IT INDUSTRY

IT industry is mainly categorized into hardware and software industry. Software industry again is categorized into software services industry and services-business process outsourcing (ITeS-BPO)). Hardware industries are responsible for different storage devices, super computers,

personal computer, monitors etc. Software services industry provides services to different industries i.e. retail, automobile, banking, manufacturing etc. to ease their operations as well as to take decision to improve their life. The hardware and software industries are now integral part of all industries. Manufacturing in India is spending the highest budget in IT followed by chemical, automotive industry[25]. IT is one of the fuel for India's growth. It has increased the employability and GDP of the country. IT industries are global in nature as they serve clients globally. Employees are functioning across geographical and functional boundaries. Hence, there is a need to dynamically adapt challenges, changes and deliver based on the demand of time.

Employees need to get appropriate knowledge and skills to meet the dynamic changes in the environment [8]. Employees need to go through a number of training programs which are customized based on their current job requirements [8]. Internet based learning has a significant impact on learning industry and profitable for the organization. They are developing and using these learnings, but they are not sure of its effectiveness. Virtual education refers to the learning that happens in virtual mode using different technology based solution. It improves the productivity of employees due to better utilization of their time.

There is a need to improve the skills of employees based on current market demand on time. So, it is training in the right time, right scope, and right audience by right instructors. However, the existing literature does not give sufficient information about any specific approach/model for virtual training conduction or evaluation. This becomes the inspiration for the current research to develop a model which will guide how to deliver the virtual training for the employees effectively to handle dynamic needs of the IT industry. Here it demonstrates that virtual classroom could be as effective as traditional classroom, by the right use of technology, people,

process and infrastructure. Virtual environments become prevalent in training and learning spaces, but evidence of their value is in the early stage. As virtual learning spaces gain acceptance and adoption in all domains, more comprehensive approach to evaluation is required.

Traditional classroom training is an efficient teaching method. But, it has its own limitations when it comes to provide training to a large number of employees at geographically dispersed locations. When participants and instructors are not co-located then conducting classroom trainings will bevery expensive with respect to the cost, time, and infrastructures. Not only travel cost but also considerable amount of time and effort will be incurred in such trainings. This challenge can be overcome by delivering the training through a virtual classroom session. Here, not only the time but also the cost and effort would be reduced. There is multiple technology based channels available to attend this entire requirement like e-learning, virtual classroom and voice conference.

VIII. VIRTUAL CLASSROOM MANAGEMENT

Classroom management is the act of administering relationships between different actors, their behaviors, and instructional settings for the training and topics for groups of learner [26]. It is a precautionary activity which will reduce indiscipline during the training. The preventive management through good planning and effective teaching can resolve many classroom problems. Hence, it is required for the instructor taking the training to have necessary learning pedagogy (i.e. the combination of knowledge and skills).

Right pedagogy is needed for virtual classrooms. Higher order learning and critical thought among students can be achieved by effective use of virtual learning pedagogical frameworks [27]. These are feasible through thoughtful and collaborative work and adequate amount of assessments using online tools such as groups, discussion groups and asynchronous/synchronous

communications etc. The different stakeholders in the virtual classroom are learner, educator and organization. All the stakeholders need to interact with each other to deliver the training. All the student information need to be there in the student database (DB) with session details and activities which can be analyzed to manage the virtual classroom. There is a knowledge repository which can be used to conceptualize, build and deliver the training.
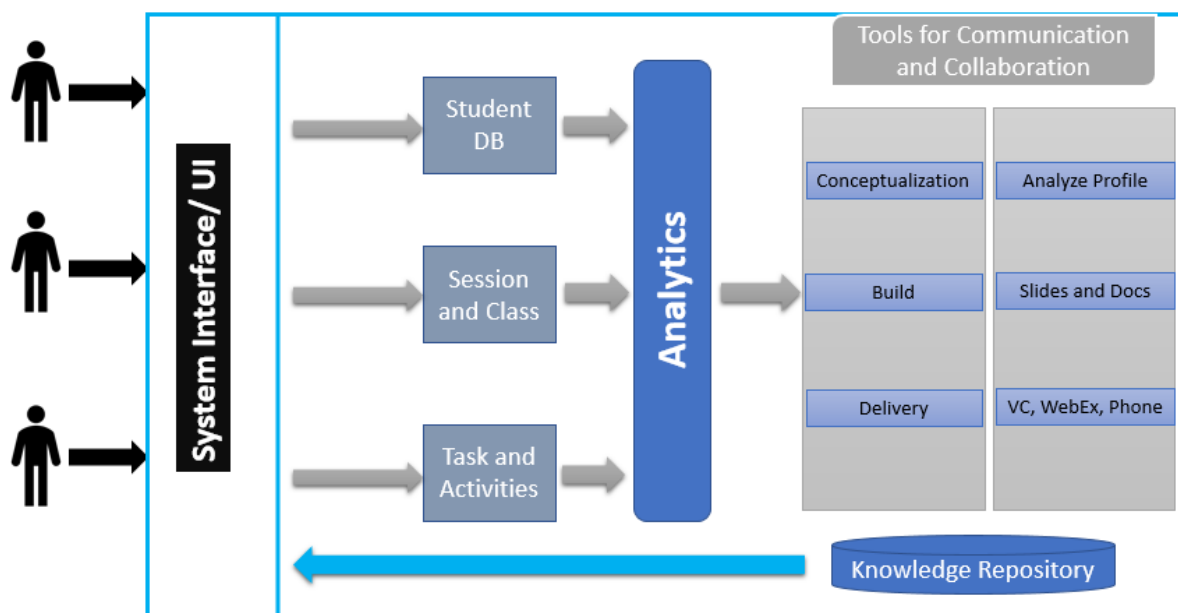

Figure 1:A conceptual model for virtual classroom management

IX. GAPS IN EXISTING MODELS

The studies give the information on virtual training conducted for different industires and also the effectiveness of the training is studied for coupel of them.Table 3 discusses on gaps in existing models for current system.

Table 3: Findings and limitations of existing systems

Author	Findings	Limitations
Bonnie R F, 2014 [28]	Challenges of virtual training.	Model to deliver and evaluate the effectiveness.
Priyadarshini R. R G, Dave D., 2012 [29]	To identify the training needs using the competency mapping methodology.	Factors i.e. course content, instructor, participants, tool to develop the model for effective virtual training.
Rufai M. M., Alebiosu S. O., Adeakin O. A. S, 2015 [27]	A conceptual model using existing virtual tool to bring about an effective classroom management strategies in a Virtual classroom.	Other factors to develop the model for effective virtual training.
Agarwal N., Nov 2015 [30]	Development of a framework for the effective skill management of professionals, identifying the importance and utility of diverse skills across the IT sector and employee profiling.	Does not cover any specific point for effective virtual training.

Prasana, Raj S.A., Oct'2016 [31]	Effectiveness of training program is directly proportional to the performance of the employee in NTPC.	It does not cover the model to conduct the training.
Sarkar S., Mohapatra S. &J.Sundarakrishnan (Sept 2015) [32]	Digital Equalizer program (DE Program) has an impact school student learning.	It does not cover the model to conduct the training for IT industry.

As evident from the studies, research conducted on training, virtual training and e-learning [19] talks about the effectiveness of training in some specific industries i.e. automotive industry [28], Healthcare [34] describe training model taking the factors like (i) competency framework for employees of the organization [29] (ii) instructor and participants as factors [31], (iii) tool and instructor [30], provides the challenges of virtual training. Based on our knowledge no research is conducted considering all the factors i.e. competency matrix, instructor, participants, tools, course content, pedagogy and organization as factors. Another gap is that the models are prepared for different industries like automotive industry [33], healthcare [34], but the studies found only few on Indian IT industry, training specifically on virtual learning. Table 3 summarizes the gaps as evident from literature review.

X. CONCLUSION AND FUTURE SCOPE

This study provides detailed explanation of training and virtual classroom features and the factors affecting the training. The virtual learning environment from leaner, teachers and institution perspective. This paper presents what are the challenges of Indian IT services industry and why virtual classroom is important for IT industry. This study suggests that the use of virtual classroom has not reached to its full potential by showing the gaps present in the existing systems. These gaps can be taken into account as a future work to develop a model which can help educators and learners to move beyond traditional classrooms and fully utilize the modern technical features for virtual classrooms.

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