



The Contribution and Impact of Virtual Learning in the COVID-19 Pandemic

¹Kanakam Siva Ram Prasad and ²Ali Akbar Babalal Bagwan

¹Kalinga University, Raipur, Chhattisgarh, India

²Department of IT, Kalinga University, Raipur, Chhattisgarh, India

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Corresponding Author:

Kanakam Siva Ram Prasad

Kalinga University, Raipur, Chhattisgarh, India

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Abstract: The COVID-19 has brought about schools gets shutdown all over the world. Around the world, over 1.2 billion youngsters are out of the homeroom. Academic institutions are increasingly switching all training programs to the e-learning format during the COVID-19 pandemic. The current work defines parallel online instruction and evaluation procedures conducted Accordingly, instruction has changed significantly with the particular ascent of e-learning, whereby educating is embraced distantly and on advanced stages. In this study, presented e-learning and online assessment SWOT analysis using program based learning. Also exposed the details over student's survey for e-learning and online assessment. As well as the overall improvement in the e-learning system after the COVID-19.

INTRODUCTION

Many institutions are now transforming their systems for learning and advancement into the domain of e-learning. And it's always a struggle to select the best approaches for their enterprise based on their needs. The choice of the right e-learning programs depends on numerous parameters such as proper analysis of needs, analysis of target audiences, task analysis, subject assessment and assessment methods. In addition to these analyses, In addition to these evaluations, the Education Development Centers have established the very relevant Learning Pyramid theory. The selection of the right distribution methods directly affects the organization's effectiveness and cost advantage^[1].

Instructional design model: It refers to a structure or method that helps to build the training instructional content. For its development, an e-learning course requires great efforts and time, so, the error will cost a lot.

The implementation of a strong and successful action plan is therefore important. A constructive Instructional Design model will be:

- Assists instructional designers in creating both a strong structure and the sense of the course content.
- Enables teaching designers to visualize training needs and to easily break down the design process training materials into phases
- Provides set guidance to ensure the training or course content addresses the learning goals set while maintaining an acceptable level intended

CATEGORIES OF INSTRUCTIONAL DESIGN MODELS

There are multiple approaches that can be adapted for the development of training programs. These design models can help us understand how knowledge is assimilated, absorbed and retained by our brains. We can

then design an e-learning course that while providing real-world value will generate practical experience. Let's take a look at the top five models of instructional design used to build courses in e-learning.

ADDIE is an acronym for 5-path layout concepts, i.e., Analysis, Design, Development, Implementation and Evaluation. Here is the short description of the stairs concerned in ADDIE methodology^[2].

Step 1 analysis: In this step, the developer ascertains the want for training. This is decided with the aid of using the exhaustive accumulation of statistics even as profiling goal college students and know-how the expectancies and desires of the organization.

Step 2 design: In this step, builders pick the guidance strategy, write objective(s) and pick proper medium and shipping methods.

Step 3 development: The path fabric is evolved in step with the expectancies formulated within side the preceding layout phase.

Step 4 implementation: The path is rolled out/released, introduced to the scholars and the impact/consequences are monitored.

Step 5 evaluation: Developers collaborate with applicable customers and primarily based totally on learner feedback, analytic and surveys; examine the general impact.

SAM

Mostly this academic layout version is used as an opportunity to ADDIE. The time period SAM is an acronym for Successive Approximation Model. The technique displays the concept that an e-learning assignment may be finished with fewer mistakes and in much less time (iterative chunks). For instance, when we have ever skilled designing an e-learning assignment and observed a making plans flaw within side the end, then SAM is the proper version for us.

The technique facilitates in dividing or finishing the assignment in extraordinary small steps, letting retool matters if needed. SAM is an agile improvement version that become created via way of means of Michael Allen, a leader and pioneer within side the layout of particularly interactive multimedia programs and getting to know tools. The technique gives three phases:

- Preparation
- Iterative design
- Iterative development

Preparation: This segment gives steps, i.e., records series and savvy start. In this step, you acquire the heritage records earlier than getting into the real layout aspect. The records helps you to recognize the client's necessities in a higher manner together with organization's goals, needs and anticipated outcome. It is extra like an answer brainstorming step to include primary layout ideas.

Iterative layout: This includes assignment making plans or assessing the finances and timeline that may be suffering from assignment improvement details. It includes attention of risk, communication, scope, useful resource implication and schedule.

Iterative improvement: This step includes layout proof. The purposeful and visible demonstration of encouraged solution, with a pattern of diverse additives to be proved and examined viability, however are extra usable and purposeful than prototypes.

In every step, it's far encouraged to collaborate with the patron to retain the system via way of means of being closest to the patron's expectations.

RAPID INSTRUCTIONAL DESIGN

The rapid instructional design is considered as a trade for different regular instructional plan models. In the perspective of different advocates, this specific model is implementable because of quick and dynamic movements in learning innovation and instructive needs. This plan model utilizes quickened plan techniques and lifts course models which are not protracted to create and can without much of a stretch be changed and adjusted on the fly. The plan approach is for quick moving e-learning conditions. The four columns to consider while taking RID include:

Get ready: It is an opportunity to establish the main connection with students by accentuating objectives and advantages. In this stage, you build up a premium in students to keep them drew in with the substance while beating the interruptions.

Present: Give students expected data to apply the new information in the commonsense world. This is done through e-learning exercises and data conveyance techniques.

Practice: E-learning situations, recreations and video demos empower the student to try their learned information. The main piece of e-learning project arranging and the board is tied in with finding the privilege internet preparing apparatus for the errand. Accordingly students should get the chance to completely strengthen the significant ideas and connection them to the current mental outline.

Perform: This requires the assessment and evaluation to test the capability and learning understanding. For example; assessment of worker's exhibition to know whether he/she has the necessary abilities^[3].

DICK, CAREY AND CAREY SYSTEM DESIGN MODEL

This is to a greater degree an orderly instructional plan model. This is like ADDIE model, being successive in nature. The model rotates around the possibility that the student effectively takes part in the learning interaction. The model incorporates student abilities, needs and learning setting into the instructional plan. Dick, Carey and Carey is an investigated model which vigorously depends on hypothetical learning standards. That is actually why it is quite possibly the most broadly actualized and regarded model in advanced education. The vital segments of this instructional plan model include:

- Ascertain learning targets and objectives
- Carry out an intensive investigation
- Research your intended interest group to sort out qualities and practices
- Develop some presentation destinations dependent on explicit rules and undertakings
- Develop e-learning appraisals dependent on necessities and inclinations of students
- Make your instructional plan
- Select just suitable e-learning assets and exercises
- Evaluate the course to pinpoint improvement zones, known as developmental assessment
- Validate that the e-learning content appropriately lines up with expected results, known as summative assessment

These central standards are as pertinent to student focused online courses regarding the study hall focused courses. It assists with molding the course that yield profoundly compelling learning results.

RAPID PROTOTYPING

The idea of fast prototyping as far as instructional plan is to make learning experience through a constant plan appraisal cycle that may proceed all through the task life. Prior to being perceived in the e-learning business, quick prototyping was first well known in the field of programming. Considering the recurrent construction of this instructional plan model, it is normally named the winding model. The means that are associated with Rapid prototyping include:

- Define the fundamental idea
- Establish a significant skeletal framework or system
- Assess the fundamental refined idea by performing client assessments
- Implement the necessary changes based on client assessments to additionally refine the substance of the learning project

The interaction is for the most part rehashed, however, many occasions as it considers significant to give just the quality e-learning deliverable.

METHODOLOGY

The COVID-19 epidemic has led to the global derangement of medical education which bore working online. Acute response to the current situation bore an increase in medical instructor's advertence towards online education. Several disquisitions determined the effectiveness of digital technologies for life-long e-learning and ceaseless professional development. E-Learning has been established worldwide in response to the crunch of health instructors and the need to switch into TEAL. E-learning has several advantages, akin as encouraging pupils for character-directed education and contemporizing the cores^[4].

Some institutes are took on the PBL system as an interactive educational strategy. The institutes shifted into digitalized PBL stuff for one while which was a good capsule for complete online PBL sessions. Recent technologies allowed the progressive creation of e-learning. Several studies have probed the benefits of these technologies in education sector, especially the PBL system.

Figure 1 was presented in the form of a SWOT analysis For example one group was composed of one moderator, one observer and seven participants (the supervisors of basic sciences departments and one core staff). The two-hour-long online synchronous focus group discussion was recorded. The analyzed data were reviewed and interpreted by an independent investigator.

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) software, Version 21 (IBM Corp., Armonk, NY). Descriptive statistics (percentages, mean and standard errors of the mean) were used to describe the quantitative variables with their analysis through paired-samples (to compare the male and female mean PBL marks) and independent t-tests (to compare the mean marks of the face-to-face and online PBL sessions). A $p < 0.05$ was considered significant.

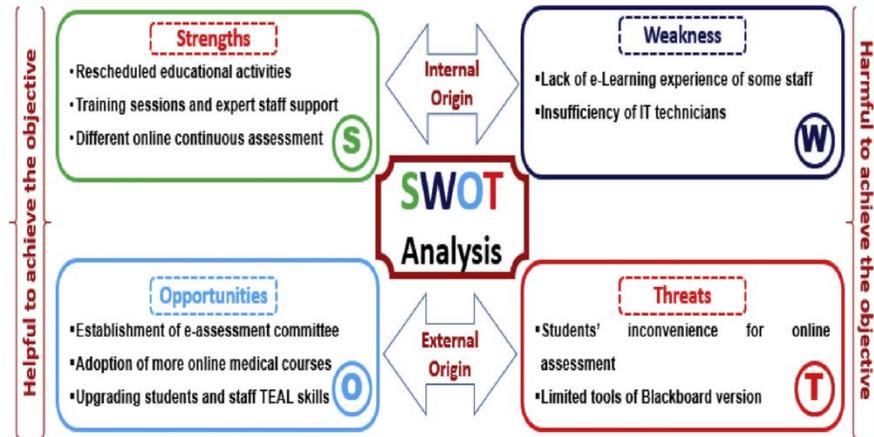


Fig. 1: E-learning and online assessment SWOT analysis

Table 1: Virtual classrooms for the students

Years	Live streaming		Duration (hours)	No. of students	Educational Activity		
	Bb	Zoom			Lec.	PBL	Seminar
First	114	27	231	3634	37	91	13
Second	108	7	216	3512	31	72	12
Third	130	34	189	1979	19	84	12
Fourth	68	24	169	3805	79	27	0
Total	420	92	805	12930	166	274	37

DATA COLLECTION

Weekly reports although the official learning management system Blackboard regarding the amount, duration and modality of various academic activities as well as the live streaming sessions and student’s group action rate were collected from the course organizers in coordination with the e-learning unit, part coordination and e-assessment committees. Analysis of scholars throughout their e-learning expertise was done supported their assessment throughout the web PBL sessions.

Table 1 represents the numbers of e-learning activities successfully implemented. Significant increase in the mean PBL marks of the female students of both first and third years was observed during the online sessions than in the face-to-face sessions of the relevant year. Additionally, there was a significant increase in the mean PBL marks of the female students of the first and third years than that of the male students of the relevant year in both face-to-face and online sessions. Student’s satisfaction towards the new modality of e-learning and online assessment was reported within the above table. the things covered within the student’s survey included the following: the success of e-learning in compensating for the urgent suspension of face-to-face teaching during the COVID-19 pandemic, efficiency of instructions announced before the web teaching, staff’s resistance and knowledge in e-learning requirements and effectiveness of online assessment in testing their knowledge and skills

levels. The Cronbach’s trial performed for all items of this survey resulted in an overall score of 0.67. Kendall test B was wont to test the correlation of those items. The correlation ranged from 0.134-0.394.

Table 2 shows the student’s survey for e-learning and online assessment. SA: strongly agree, A: agree, NAD: neither agree nor disagree, D: disagree, SD: strongly Disagree.

IMPORTANCE OF E-LEARNING DURING THE COVID-19

The COVID-19 has brought about schools gets shutdown all over the world. Around the world, over 1.2 billion youngsters are out of the homeroom.

Accordingly, instruction has changed significantly, with the particular ascent of e-learning, whereby educating is embraced distantly and on advanced stages. Examination recommends that internet learning has been appeared to expand maintenance of data and take less time which means the progressions COVID have caused may be digging in for the long haul^[5].

While nations are at various focuses in their COVID-19 disease rates, overall there are right now >1.2 billion youth in 186 nations influenced by school terminations because of the pandemic. In Denmark, kids up to the age of 11 are getting back to nurseries and schools after at first shutting on 12 March, yet in South Korea understudies are reacting to move calls from their

Table 2: The student’s survey for e-learning and online assessment

Questions	N	SA		A		NAD		D		SD	
		n	%	n	%	N	%	n	%	n	%
E-Learning compensated the suspension of face-to-face teaching due to the COVID-19 pandemic	250	92	36.8	103	41.2	30	12.0	19	7.6	6	2.4
Educational activities got enough time during the online teaching	250	75	30.0	97	38.8	43	17.2	25	10.0	10	4.0
Staff have enough experience in e-learning requirements	250	19	7.6	81	32.4	74	29.6	62	24.8	14	5.6
Interaction during online session was satisfactory	250	50	20.0	95	38.0	52	20.8	38	15.2	15	6.0
Announced instructions before quizzes are useful and sufficient	250	96	38.4	91	36.4	31	12.4	20	8.0	12	4.8
Online assessments are effective to test the knowledge level	250	66	26.4	84	33.6	41	16.4	34	13.6	25	10.0
Do you suggest online teaching for some theoretical courses?	250	149	59.6	49	19.6	13	5.2	14	5.6	25	10.0

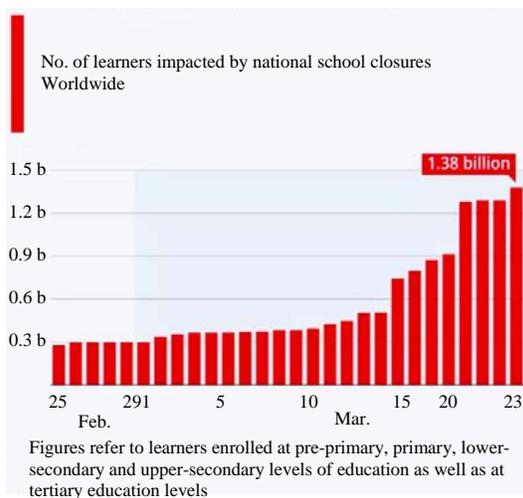


Fig. 2: COVID-19’s staggering impact on global education

educators on the web. Indeed, even before COVID-19, there was at that point high development and selection in instruction innovation with worldwide edtech ventures arriving at US\$18.66 billion of every 2019 and the general market for online schooling projected to reach \$350 Billion by 2025. Regardless of whether it is language applications, virtual mentoring, video conferencing apparatuses, or web based learning programming; there has been a critical flood in utilization since COVID-19 (Fig. 2).

Considering basic premium, various web learning stages are without offering induction to their organizations including stages like BYJU’S, a Bangalore-based informative development and electronic

training firm settled in 2011 which is as of now the world's most incredibly regarded edtech association. Since announcing free live classes on its Think and Learn application, BYJU's has seen a 200% addition in the amount of new understudies using its thing, according to Mrinal Mohit, the association's Chief Operating Officer. Tencent examination corridor, meanwhile has been used generally, since, mid-February after the Chinese government prepared a fourth of a billion full-time understudies to proceed with their examinations through online stages. This achieved the greatest “online turn of events” all through the whole presence of guidance with around 730,000, or 81% of K-12 understudies, going to classes by methods for the Tencent K-12 Online School in Wuhan.

Various associations are supporting capacities to give an across the board asset to instructors and understudies. For example, Lark, a Singapore-based joint exertion suite from the outset made by ByteDance as an inside contraption to meet its own sensational turn of events, begun offering instructors and understudies boundless video conferencing time, auto-understanding capacities, consistent co-modifying of undertaking work and splendid timetable arranging, among various features. To do so quickly and in a time of crisis, Lark slanted up its overall specialist structure and planning capacities to ensure trustworthy accessibility.

Alibaba’s distance learning course of action, Ding Talk, expected to get ready for a similar combination: “To help tremendous degree far away work, the stage tapped Alibaba Cloud to pass on more than 100,000 new cloud laborers in just two hours per month back setting up another point of reference for brisk cutoff expansion”, as demonstrated by DingTalk CEO, Chen Hang.

Some school locales are forming novel affiliations, like the one between The Los Angeles Unified School District and PBS SoCal/KCET to offer close by educational transmissions, with autonomous divers focused in on different ages and an extent of modernized other options. Media relationship, for instance, the BBC are also driving virtual learning; Bitesize Daily, dispatched on 20 April, is offering 14 weeks of instructive program based learning for adolescents across the UK with VIPs like Manchester City footballer Sergio Agüero showing a part of the substance.

While some acknowledge that the unrehearsed and snappy move to electronic learning with no readiness, lacking bandwidth and little plan will achieve a defenseless customer experience that is uncondusive to upheld improvement, others acknowledge that another cross variety model of guidance will emerge, with basic focal points. "I acknowledge that the joining of information development in guidance will be moreover enlivened and that web based preparing will in the end transform into an essential piece of school preparing", says Wang Tao, Vice President of Tencent Cloud and Vice President of Tencent Education.

There have recently been productive advances among various universities. For example, Zhejiang University sorted out some way to get >5,000 courses online just fourteen days into the change using "DingTalk ZJU". The Imperial College London started offering a workshop on the investigation of Covid which is as of now the most enrolled class dispatched in 2020 on Coursera.

Many are as of now advancing the focal points: Dr Amjad, a Professor at The University of Jordan who has been using Lark to train his understudies says, "It has changed the strategy for teaching. It engages me to contact my understudies even more gainfully and suitably through talk social occasions, video get-togethers, projecting a voting form and moreover chronicle sharing, especially during this pandemic. My understudies in like manner find it is less difficult to pass on Lark. I will hold fast to Lark even after COVID, I acknowledge standard disengaged learning and e-learning can go hand by hand".

THE TROUBLES OF WEB LEARNING

There are, nevertheless, troubles to endure. A couple of understudies without reliable web access or conceivably development fight to participate in cutting edge learning; this opening is seen across countries and between levels of pay inside countries. For example, while 95% of understudies in Switzerland, Norway and Austria have a PC to use for their schoolwork, only 34% in Indonesia do, as demonstrated by OECD data.

In the US, there is a tremendous opening between those from advantaged and ruined establishments: while essentially all of the 15-year-olds from an exceptional

establishment said they had a PC to work on, practically 25% of those from obstructed establishments didn't. While a couple of schools and governments have been giving automated stuff to understudies up the creek without a paddle, for instance, in New South Wales, Australia, many are at this point stressed that the pandemic will widen the progressed detachment^[6].

CHANGING TUTORING FUNDAMENTAL

Undeniably this pandemic has completely upset a tutoring structure that much state was by then losing its congruity. In his book, *21 Lessons for the 21st Century*, specialist Yuval Noah Harari charts how schools continue focusing in on standard academic capacities and redundancy dominating, rather than on capacities, for instance, fundamental thinking and flexibility which will be more huge for accomplishment later on. Could the progress to web learning be the force to make another, seriously convincing methodology for educating understudies? While some worry that the surged thought of the change online may have demolished this evenhanded, others plan to make e-adjusting part of their 'new common' in the wake of experiencing the favorable circumstances direct. The meaning of dispersing data is included through COVID-19 Huge world events are routinely an accentuation point for fast progression an unquestionable model is the rising of online business post-SARS. While we actually can't see whether this will apply to e-learning post-COVID-19, it is one of just a small bunch not many zones where adventure has not vanished. What has been explained through this pandemic is the meaning of scattering data across limits, associations and all bits of society. In case electronic learning development can expect to be a section here, it is interminable inventory of us to examine its most extreme limit.

CONCLUSION

After the WHO declaration of the COVID-19 pandemic, the current study investigated the advantages of the move towards e-learning and online evaluation which is a promising strategy with great educational potential. In terms of student and staff happiness, achievement and enhancement of technical education skills, this effective digital learning environment was noted.

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