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BLENDED LEARNING IN 5Es MODEL

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Abstract: The dispositions of these views are reflections of demonstrations during training for government school teachers in Agastya International Foundation. We have been observing educational think-tanks widely debated over nature of Blended Learning since 1990s and arrived at little consensus. Graham (2006) stated in easily digestible form of definition that Blended learning systems as learning systems that "combine face-to-face instruction with computer mediated instruction". The modern technological innovations elevated the meaning to another way in current days. Norm Friesen, researcher put forth another statement "Blended learning designates the range of possibilities presented by combining internet and digital media with established classrooms that require the physical co-presence of teacher and students". So the Blended Learning is the instructional design embedded with digital platforms; it delivers curriculum, resource materials and instruction and evaluation procedures. This context based learning approach is relatively more effective when it comes to fully online / offline or fully face-to-face learning in traditional classroom setting. The features of Blended Learning having wide scope to incorporate in 5Es model for science learning. This further strengthens concrete understanding through hands on activities there by facilitating construction abilities of learners.

Keywords: Blended Learning, Face-to-face instruction, Computer mediated instruction, Physical co-presence, 5Es model, Hands on activities.

Introduction

The applications of **Piaget's** psychology directed the **Robert Karplus** to propose his own teaching-learning model in 1960's to prepare science resource materials. Later several constructive models were outlined by educationists. In the year 1987, **Robert Bybee** put forth **5Es'** progressive model Cycle for science learners under the project-BSCS (Biological Science Curriculum Study). The 5Es are the acronym of the logically arranged five cyclic phases – **Engage, Explore, Explain, Elaborate and Evaluate**, which are to be administered in the learning ecosystem. The 5Es classroom delivery by the teacher-trainees

letting learners to trace the understanding through five steps over a period of time. According to subject matter expert **Beverlee Jobrack**, "Educational movements, such as inquiry-based learning, active learning, experiential learning, discovery learning, and knowledge building, are variations of constructivism". The unique features of blended learning and 5Es model are supplementary as well as complentary to each other. Utilisation of both blended and 5Es model is a simplest innovative paradigm, fosters new avenue to enhance digitalised leaning platforms with available reasonable resources at all levels of education.

Features of Blended Learning Classrooms

- It is mixture of traditional instruction, technology rich instruction and online learning materials come in the digital form with paperless society
- Student centric learning ecosystem in which students have some control over Pace, Place, Path and Time
- Facilitate students abilities to work in their best learning modality, at their own speed and to collaborate and cooperate with other students to maximise learning
- Students have some control to work in best learning modality at their own speed and to collaborate with each other students to maximise learning
- Blended learning demands an effective teacher to facilitate and guide the students
- Increased interactions between teacher and pupil enhances engagement in learning accountability

5Es Constructivist Class Room

According to constructive approaches, it is very suitable to structure small groups, each group of 4-6 members. The components of constructivist classroom facilitates the teacher to fallow a facilitator role in the learning ecosystem where he has to stimulate the learners towards sensitising the cited problem, then actively engage in developing and refining the deeper meaning of concepts for remediation.

1. **Engage**

This is the first step of learning cycle where in teacher establishes focus on learning environment, learning activities and minds of the students' readiness to create readiness towards previous knowledge by asking questions or else jotting down. These current activities foster students thinking, create interest in identifying knowledge gaps between previous and upcoming concept to learn where by problem will be sensitised. The student's

will engage more with audio-visual materials. The different techniques of engaging learners are-Ask open ended questions, Act out problematic situations, Show surprising events, Note unexpected phenomena, Consider possible responses to questions, Present situations where student's perceptions vary.

2. Explore

During the process of exploration phase, students actively explore the new concept through concrete learning experiences. They will be asked to go through the scientific method and communicate with their peers to make formal discussions, processes, observations and skills. This phase allows students to involve in hands-on activities thus disequilibrium remedied. Learners are guided to find solutions for the issues raised during engage phase. The teacher's role is to facilitate structured learning environment there by students are directed to actively participate in discovery process for knowledge construction. Some designed investigative activities are Facilitate structured activities, Employing problem solving strategies, Materials for experimentation/hands on activities, sequencing pattern of events, Incite for students' drive towards inquiry processes, possible alternatives by brainstorming technique.

3. Explain

This a teacher led phase in which learners are encouraged to explain the concepts what they have explored in previous phase. Learners' share their exploration experiences by refocusing on their attention with specific aspects of engagement. Teacher assists the students to synthesize new knowledge skilfully, clearly and briefly. Before imparting technical details the teacher seeks more clarification by asking questions. Expressing this abstract knowledge through communicable form in different ways; Learners presents the constructed idea, Explain the model with constructions, Represent information through symbols, pictures / figures / graphs, Presenting data through patterns, Present summary, oral and written reports, Reviewing and criticizing the solutions.

4. Expand

In this fourth phase space is given to learners to apply their conceptual understanding and allows them to exercise skills and behaviours. The efforts of learners develop a deeper understanding and cementing their knowledge with new one. Further by going through additional investigations skills are reinforced among learners, this in turn helps to create presentations. Teacher should give opportunities to apply the constructed knowledge in several real life situations. The some tasks develops expansion abilities; Correlate the knowledge in real life situation, Sharing views and information, Transfer knowledge and

skills, Ask new questions, Create products and promote ideas

5. Evaluation

This last stage helps the teacher to evaluate learners both formally as well as informally and encourages learners to assess their understanding and abilities. Observe the students skill development and note whether students approach problems in a different way based on what they learnt. Assign written examinations to evaluate core subjects. Self-assessment, Peer- assessment, Performance and portfolio assessments, Projects and problem based activities, Achievement tests are also employed.

PLAN OF 5Es MODEL IN TEACHING SCIENCE

Standard: VIII **Subject:** Physics (Science)

Topic: Magnetism and Electricity **Concept:** "Earth acts as a Magnet"

5Es Phases	Resources Employed	Teaching-Learning Interactions	Learning Out-Comes of Teacher
ENGAGE	• **Internet** accessed **Computerprojector** used for accessing resource materialsand OERs • **Projecting pictures** of types of magnets • **Streaming videos and sketches / pictures** of Laws of attraction and repulsion, in Youtube and in other sites • **Streaming videos** of suspended bar magnet	• Forming small groups, each one of 4-6 students • Teacher assigns tasks sequentially to students to observe, interact, discuss and express reflections sin all the phases sufficient time will be given. • Students, identify and name the types of magnets • Students curiosity increases, identify the laws of attraction and repulsion of magnet • Students come across problematic situation, focus on problem "Bar magnet stands in North-South directions" • Teacher asks, "Why suspended bar magnet stands in North-South directions?"	• Implementing Plan, Organising classroom • Instructing, arranging • Creating digital environment, Initiating, applying digital literacy, eye-hand and oral co-ordination • Projecting, engaging peer interactions, Reiving answers • encouraging discussion and reflections • Building social-psychological relationships • Creating critical situation, peer interactions • Opportunities to think, receive, and attend, collaborate, cooperate

EXPLORE	• **Streaming videos, pictures and sketches** of Geographic North and South poles of Earth • **Streaming videos, pictures** and **sketches** of laws of magnetism • **Sketches** of suspended bar magnet and earth's magnetic field	• Students are being observed videos, pictures and sketches of Geographic North pole (GNP) and Geographic South Pole (GSP) of Earth • Teacher asks, "Is there any link between GNP, GSP with North and South poles of suspended bar magnet?" • Students are being asked to view videos, watch again poles of suspended magnet and think about fallowing questions • Why did not bar magnet suspended in East-West direction? • Is something attracts N-pole and S-pole of magnets? • Students says something attracts both poles • Which magnetic pole exists in GNP? Which magnetic pole exists in GSP? • Students say South Magnetic Pole exits near GNP and North Magnetic Pole exists near GSP. • South pole near GNP, North pole near GSP • Is Earth's south magnetic pole attracts North Pole of suspended magnet? Is Earth's north magnetic pole attracts South Pole of suspended magnet? • Students say "Yes, because earth acts as a magnet"	• Space given for engaging, mentoring, navigating, sequencing, selecting, presenting guiding, focusing, social-psychological, deeper meaning • Developing- peer interactions, • motivating, relating, analysing, comparing abilities • Facilitating made to refocus, compare, relate, judging, logical-reasoning, collaborating, co-operating • Directing to think in main direction, peer interactions • Adapting, reorganising, drawing judging, peer interactions • Encouraging for decision making • Clueing technique, employed, collaborative and co-operative tasks given • Tracing, concluding, judging, reasoning, • Guiding, reasoning, judging, peer interactions, synthesising • Collaborating, mentoring • Reciting and concluding

EXPLAIN	• **Streaming videos, pictures and sketches of** suspended bar magnet and earth's magnet	• Opportunity to students to summarise concepts of earth acts as a magnet and suspended bar magnet rests in N-S direction. • Later teacher presents the information with key words through patterns, correcting students doubts	• Valuing, receiving, reorganising, correcting, presenting, criticising, reviewing and refing, sequencing, selecting, presenting
EXPAND		• Teacher asks, "Tell me where you are using this concept in our life?" • Students answers, "In sailing, in constructing building (Vastu) and in finding direction and degrees of location.	• Space provided for applying, correlating, sharing, transferring, and performance, peer interaction
EVALUATE		• Perform the activity tell me why earth acts as a magnet? Students perform the experiment and explains earth acts as a magnet	• Observing through schedule, performance, check list, assessments through tools, Introspection

Conclusion

The integration of Blended Learning digital technology in Indian conventional classrooms environment for school is the big initiation compared to other modes of online/offline instructions. The first three stages in 5Es model certainly facilitate for incorporation of various digital formats. This will enhance motivational abilities of presenter as well as learning abilities of students. Accessing Open Educational Resources is easing resource based teaching which strengthens concept learning. We can make best utilisation of such digitally readymade resource materials available in educational and social sites during teacher-training processes over the internet servers. This boosts the teacher- trainee's confidence at the outset of practicing sessions which further takes to teach twenty first century generations to empower digital India.

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