

## The 7E Learning Cycle and its Implementation in the Classroom

*Pooja Birwatkar*



Education is, in present times, truly attuning itself to the demands of the global world where knowledge is now available at the click of a button. In this arena of ICT dominant, dynamic world, there have been major shifts in paradigms of education with the focal point now being the learner. Education definitely has surpassed the give-and-take relationship between teachers and students who are now co-learners, together weaving the thread of knowledge. No longer can one simply associate learning with the 3 R's (reading, writing and arithmetic) as it has moved beyond the realms of gathering knowledge to a state of constructing one's own knowledge based on first-hand experiences. In this light there have been several researches conducted to bring forth qualitative improvement in pedagogical practices. As per the findings of the *National Research Council (NRC)* regarding how people learn, it is crucial that learners have to be interested in what they are learning and engage with what is being learnt. The learning has to be meaningful and useful for the learner and should involve the learner's active participation whereby they compare and contrast their previous ideas with newer ones and construct their own quantum of knowledge. The learners further need new contexts and situations to apply their gradually-evolving knowledge. In this wake, several models of learning have been introduced like the *5E Learning Cycle* and *7E Learning Cycle*.

### **Historical Background**

The early 20<sup>th</sup> century saw radical transformations in the educational scenario that was backed by the pedagogical support of philosopher and specialist, *Johann Herbart* who advocated the crucial role experiences play in integrating prior ideas with current knowledge, leading to generating concept that would then become another more enriched experience. This cyclical process based on analysis of experience would lead to assimilation of knowledge which would be largely learner-constructed. In 1962, *Karplus* and *Atkin* proposed a *Learning Cycle* with three phases namely: *exploration, invention* and *discovery*. These phases later were renamed by *Karplus* as *exploration, concept introduction* and *concept application*. This learning cycle underwent modifications owing to the work done by *Rodger Bybee* and colleagues at *Biological Sciences Curriculum Study (BSCS)* and evolved as the *5E Learning Cycle* in 1997.

### Understanding the 5E Learning Cycle

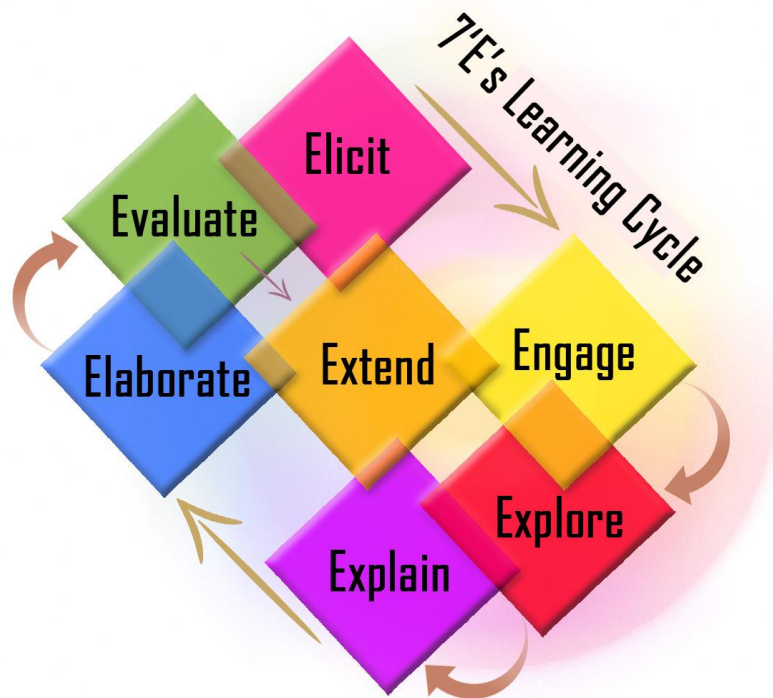
The 5E Learning Cycle has been credibly influenced by the extensive research findings of the *National Research Council (NRC)* highlighting that students have a repertoire of preconceptions regarding the world. A learner amidst new ideas has to bring forth the previous conceptions, compare, contrast, explore, analyze them in wake of the new idea and finally when satisfied, integrate the new information in the conceptual framework which results in retrieval, and accommodates itself as experience.

The 5 'E's denote different phases of learning like *engage, explore, explain, elaborate* and *evaluate*.



## The 7E Cycle

Keeping in pace with the demands of the constructivist paradigm of knowledge, the highly successful 5E Learning Cycle was further expanded and termed as the 7E Learning Cycle by *Arthur Eisenkraft*. This model, while retaining the 5 'E's, further refines itself by way of two additional 'E's, i.e. *elicit* and *extend*. *Elicit* is introduced before the *engage* phase and is devoted to bringing forth prior understandings. *Extend* is the last phase which aims to transfer the learning to new and unfamiliar situations and somewhere moves beyond conceptualization to abstraction. While there has been no denying that 5E model has been effective, the 7E model goes a step further in terms of fulfilling the broad aim of education.



### The Various Phases of the 7E Cycle

**1. ELICIT:** This phase refers to bringing on to surface all prior conceptions and understandings for better transfer of knowledge. Finding out **what students know** is the aim of this phase. While this is a preliminary phase, a regular class may not always begin with it as this phase could begin much earlier and could be at times informal too. Students could very well be assigned this as previous day's homework and could involve watching a movie clip, reading and referencing,

exploring the given websites, reading news articles, reflecting, creating an object or maybe simply gathering associated evidences and materials.

**Example: Concept - Parts of a flower**

The teacher can design the *elicit* phases in the following ways:

Give students homework in the form of collecting different flowers, viewing them with magnifying lens, drawing them, finding out the names and details about them. The next day's class can begin with these experiences of the students.

Additionally the teacher can provide links to useful websites and ask students to go through them. This exercise can also be done in the school garden by making students explore the plants there.



**2. ENGAGE:** This is an important phase as the goal is to capture the learner's interest, motivate them to link their prior experiences with the concept and put them forth. The teacher's task in this phase is to bring to surface prior ideas, experiences and notions that students have regarding the concept to be learnt and hence preparing them for the learning process. Establishing connections with prior experiences and readiness to critically assess them in wake of new experiences form the base of this phase. It facilitates in making the teacher discreetly assess the student's prior knowledge and hence suitably redesign or modify their learning pace. It also touches upon *Thorndike's* first important law of learning - '*readiness*' of the learner.

**Example: Concept - Parts of a flower**

The teacher can design the *engage* phase in the following ways:

Bring flower specimens in class and posing questions to the students at the beginning of the class. Creative expressions can also be given an outlet by asking students, in groups or individually, to present the flowers in a creative manner or write a story about them. This may further contribute in generating their interest.



**3. EXPLORE:** According to *Bybee*, in this phase, students are given a set of activities and exposures that help them to analyze their own prior conceptions, realize their misconceptions, identify the processes and skills and try to understand the particular concept being presented. Students in this phase either individually or in groups, may generate new ideas, formulate and verify hypothesis, pose questions as well as answer them, explore all possibilities and indulge in investigations. At times, students may face confusion or conflict as they indulge in metacognition, exploring the gaps in their knowledge quantum and understanding how to bridge those gaps and further their learning. The teacher's role is to construct and present before the students problems and situations that would lead them to think and reflect.

**Example: Concept - Parts of a flower**

Once through with exploration, students can be handed over individual specimens and asked to dissect and see the parts, draw diagrams, compare their diagrams with those of others. Questions that can be discussed in class are:

- a. *How many parts are there in the flower?*
- b. *What are the names of the parts?*
- c. *Where are the different parts located?*
- d. *Why does a flower have these parts?*
- e. *What is unique about these parts?*



#### 4. EXPLANATION

In this phase the teacher can directly introduce the concept and provide a related explanation. Students are also given a chance to explain their understanding of the concept. The teacher's explanation contributes in developing a deeper and more enriching understanding, especially the abstract parts.

According to *Bybee* (2006), teacher's explanations will help students, in the wake of their *engagement* and *exploration* phases, to present their newly developed or refined understanding about the concept.

##### **Example: Concept - Parts of a flower**

At this stage, the teacher can use specimens, models, video clips, pictures, etc. to explain in detail the different parts of a flower. Students are also given the chance to explain what they have understood.



#### 5. ELABORATION:

This phase involves the teacher posing challenges and problems before the students which logically follow from their understanding that they have developed in the *explanation* phase. Students apply their newly-constructed knowledge in novel contexts. It also involves the teacher providing students with newer information that may be an extension of what they had previously learnt. This phase could involve induction as well as deduction, and further deepens the understanding of the students.

**Example: Concept - Parts of a flower**

Following a deep insight into the structure and functions of the parts, students could be asked questions regarding *pollination*. They can be asked to identify male and female flowers and introduced to concepts like *monoecious* and *dioecious* species, etc. through various examples.



**6. EVALUATION**

The evaluation phase encourages students to assess their understanding and abilities and provides opportunities for teachers to evaluate their progress towards achieving the educational objectives set out. As per *Bybee* (2006), evaluation aids in making students assess their own understanding while also providing teachers with the opportunity to evaluate the progress of the students in terms of achievement of the specific educational objectives. This can be done in terms of both summative and formative assessments. Formative assessment is a continuous process whereby changes in the pattern of thinking of the students, participation, refinement in ideas, formulation of hypothesis and testing it, arriving at generalizations, etc. are being assessed. Summative assessment may be done in terms of grading. An evaluation could take any form in terms of being a question-answer round, quiz, test, game or developing a product through projects.

**Example: Concept - Parts of a flower**

## Question-Answers

1. *Name the different parts of a flower.*
2. *Show the location of the parts.*
3. *What are the functions of the different parts?*
4. *What kinds of modifications are shown by the various parts?*



## Project work:

- Make a scrapbook of different local flowers with detailed descriptions of each.
- Make a model of the various parts of a flower.

**7. EXTEND:** This phase involves practice of transfer of learning to new and unfamiliar situations.

## Example: Concept - **Parts of a flower**

- a. Examine flowers and understand the modifications in them.
- b. Prepare a report using videos, pictures of different flowers and explain them in details.





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## Lesson Plan on Using 7 E Learning Cycle to Teach *Conservation of Water*

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**Mode:** This topic can be taken up as a theme and spread over different school subjects (*Science, Mathematics, History, Geography, Languages, EVS, Value Education, etc.*).

### Overall Objectives of the Lesson

Students will

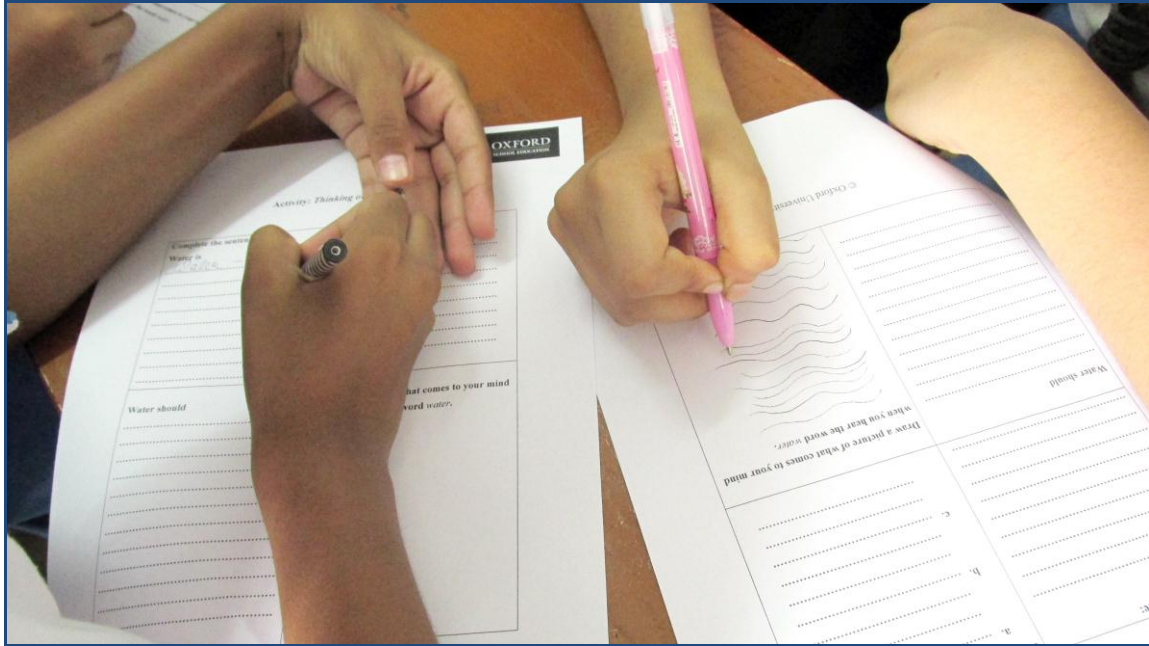
- ✓ recognize different types of water on Earth,
- ✓ critically examine each type of water in terms of its suitability for consumption,
- ✓ understand the importance of water conservation,
- ✓ examine the consumption patterns of water,
- ✓ develop ways to conserve water.



**ELICIT: (Subject - Languages)**

**Activity: THINKING OUTSIDE THE BOX**

<p><b>Complete the sentence.</b></p> <p><b>Water is</b></p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p><b>3 facts about water:</b></p> <p><b>a.</b> .....</p> <p>.....</p> <p>.....</p> <p><b>b.</b> .....</p> <p>.....</p> <p>.....</p> <p><b>c.</b> .....</p> <p>.....</p> <p>.....</p>
<p><b>Water should</b></p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p><b>Draw a picture of what comes to your mind</b> <b>when you hear the word <i>water</i>.</b></p>



**ENGAGE: (Subject - Science)**

**Activity: TOO MUCH OR TOO LESS: THINK ABOUT IT**

**Materials needed:** Glass cubicle or an aquarium, measuring cylinders, ice trays, salt and globe

**Procedure:** The teacher puts 5 litres of water in the aquarium. Students are asked to calculate 3 % of 5 litres (150 millilitres) and take out that much water from the glass vessel with measuring cylinder. Now from this 3% water, students are asked to make 3 equal parts using measuring cylinder. Take out one part (approx 50 mililitres) water and mix the other two parts (100 millilitres). These 2 parts are put in ice trays (the teacher can bring frozen ice trays with same volume of water). Salt is added to the water in the aquarium.

Teacher asks students to put labels across each: *salt water* (in seas and oceans), *fresh water* (in lakes and other water bodies) and *water in glacier ice* (North and South Pole).



**Salt water**



**Fresh water**



**Glacier ice**

Students are asked to taste water from all three containers. A discussion is held regarding the experience of the students. The globe is then used to show the distribution of water on earth.

### **EXPLORE: (Subject - Geography)**

Teacher will divide the students into groups and each group will have an *envoy* (a student representative). Students will then make a list of countries across the world facing water scarcity. They will also make a list of the places in India where there is severe water shortage. Using *Google Earth*, these countries and places can be visited by students to generate a report on their findings. The *envoy* from each group will visit the other groups and debrief them about the findings. Groups can then also make a PowerPoint presentation regarding the same.



### **EXPLAIN: (Subject - Science)**

The teacher here would explain with the help of a PowerPoint presentation the facts regarding water scarcity and need for conservation of water.

### **ELABORATE: (Subject - Math)**

Students will conduct water audit in school and home and plot a common graph by averaging the findings. A class discussion on the same will be held.

## WATER AUDIT SHEETS

### SCHOOL

<b>Places where water is used</b>	<b>Frequency</b>	<b>Amount of water consumed by one user</b>	<b>Average number of users</b>	<b>Total water consumed</b>
School washbasin				
Cafeteria				
Garden				
Staff room				
Any other place				

### HOME

<b>Activity</b>	<b>Frequency</b>	<b>Amount of water consumed by one user</b>	<b>Average number of users</b>	<b>Total water consumed</b>
Cooking				
Cleaning vessels				
Bathing (shower and non-shower)				
Brushing (with tap running and tap closed)				
Washing (top loading and front loading machines)				
Car washing				
Any other				



**EVALUATE: (Subject - Language)**

Debate on the topic- *Feasibility of Desalination Plants in India*

At this stage teacher may start asking questions about the concept taught.

**EXTEND: (Subject - Science)**

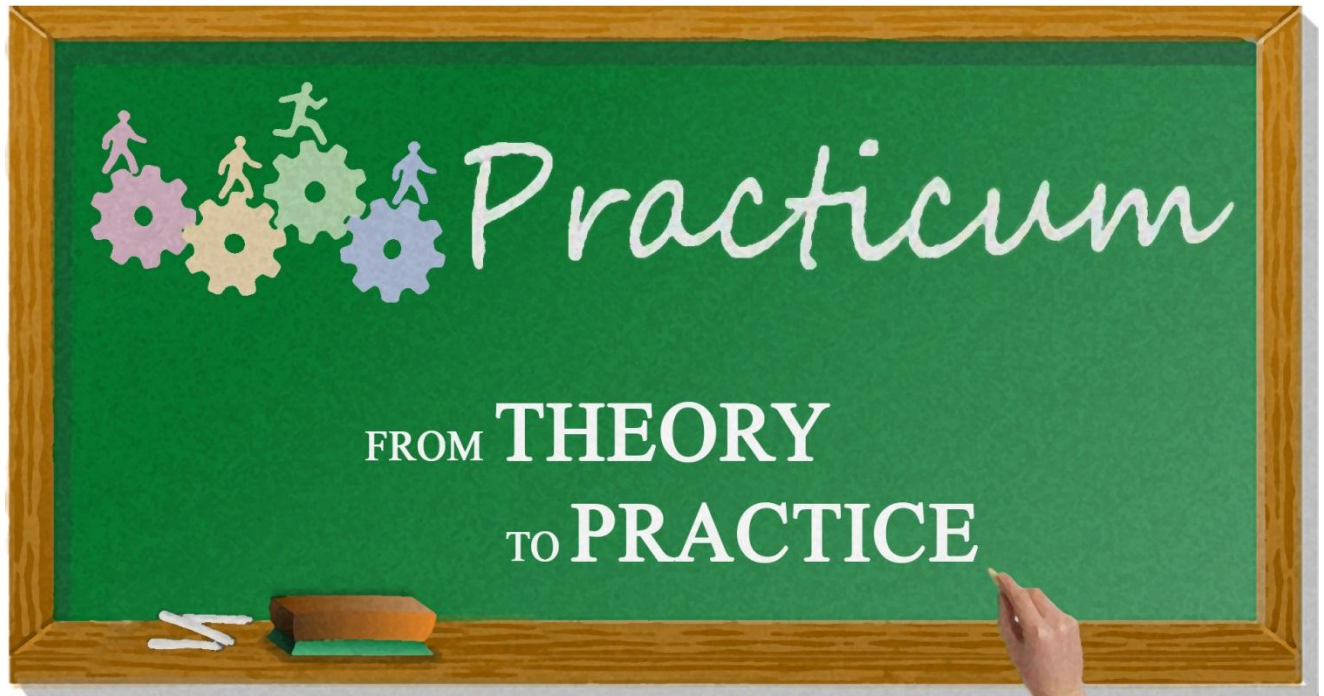
Students will:

- ✓ design a model for recycling domestic water.
- ✓ prepare a presentation on water conservation tips.



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## Words Section for August Issue of OUP Newsletter



### **Practicum (noun)**

**Meaning** ~ A practical section of a course of study. This form of experiential learning usually is a course or student exercise involving practical experience in a work setting (whether paid or unpaid) as well as theoretical study, including supervised experience as part of professional pre-service education.

*(Oxforddictionaries.com)*

**Origin (and additional information)** ~ The term's first known use was in the early 20th century, sometime around 1904. It is derived from late Latin *practicum*, neuter of *practicus*, meaning *practical*, also from German *praktikum*.

A *practicum* is a graduate level course, often in a specialized field of study, that is designed to give students supervised practical application of a previously or concurrently studied theory. Practicums (student teaching) are common for education and social work majors. In some cases, the practicum may be a part-time student teaching placement that occurs the semester before a student's full-time student teaching placement.

It is also called *work placement*, especially in the UK. The process resembles an internship; however, the latter is often not part of the school program.



A practicum is involved in optional parts of schooling. Practicum is widely practised in Asia. In Pakistan it is truly mandatory and to practise it is quite necessary.

A practicum has several objectives and learning goals and it helps students translate into practice in a particular setting, the concepts and principles taught in the classroom by

- a. developing and exhibiting a professional level of work performance,
- b. approaching problem-solving tasks or helping interventions in a way that reflects a spirit of inquiry, a capacity for conceptual thinking, a grasp of the structure of knowledge and theory pertinent to a particular problem, an ability to transfer to a specific situation applicable concepts and principles, and a readiness to seek new knowledge when needed to guide their professional activities,
- c. using a variety of problem-solving tasks involving individuals, groups and communities, the technique essential to all professional practice, inquiry, analysis, assessment, planning and action to implement change strategies,
- d. using in purposeful professional relationships, a disciplined self-awareness and a genuine concern for people, and understanding of them, their capacities, their problems and the social systems with which they interact.
- e. demonstrating in discussion and field practice, a personal and professional commitment to participate responsibly and contribute to the research and knowledge needed to achieve their objectives.

### **Usage ~**

- i. *The practicum enables the student educators to do everything from running staff meetings to ordering supplies.*
- ii. *Early in the intermediate course, students select one child in their practicum classroom for focused observation.*
- iii. *Suddenly, I realized I was no longer a practicum student or a student teacher: I was the teacher.*