



## Situation

Mr. Ramprasad Sharma, a middle-school science teacher in the Bharatiya Vidyalaya School in Lucknow (India) first began using computers when he learned that he could save time in making his worksheets by using Office 2003.

A few days ago, when he attempted to explain the concept of an AC motor v/s a DC motor in class, his students seemed baffled because the explanation provided in the state board textbook was not clear or understandable. He went into the newly established computer lab facilities for the teachers of the school - and began to Google the terms “ac dc motor good explanation graphics pictures”. As you would expect, he did not find anything useful from his search results.

## Introduction

Teachers in many schools situated in urban and semi-urban locations in India are now being expected to use newly installed desktop computers to support learning activities in classrooms, along with identifying and distributing any relevant resources found on the Internet. However, the technology and information literacy rates of teachers in a large number of schools remain low, and they face difficulty in being creative and effective in locating and adopting these resources.

## Objectives

- » Recognize situations in which technology resources could be helpful to teachers in middle schools, upon understanding their scope and applicability in classroom learning
- » Structure a distance-learning course that encompasses the important concepts identified in this process
- » Adopt essential learning sciences to provide a learner-centric platform for learning the core concepts and ideas
- » Prototype a comprehensive and quality feedback-enabled testing mechanism

## Methodology

Identify the learning goals and objectives for the course



Outline a course structure around core ideas that allows for scaffolding



Build a single module and evaluate learning experience and outcomes



Apply learning sciences on the content in the module and in assessments/tests



Iterate over the structure & content of the module along with its progression, based on learning sciences outcomes

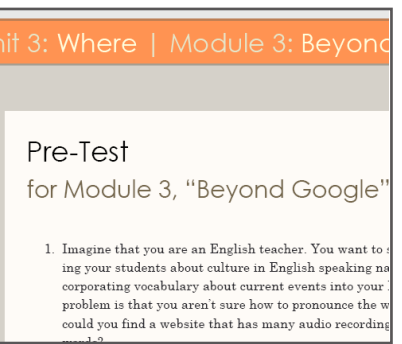
## Solution:

# Bodh

**Bodh** is a web-based distance learning course on technology and information literacy for teachers in middle schools in India. It is meant to cover important concepts which are helpful to teachers for understanding how to look for content and adopt it in their teaching and resources. It adopts key learning sciences to support this process.

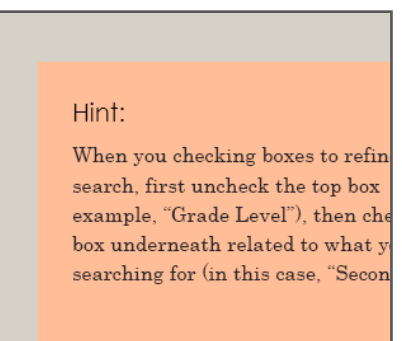
## EXAMPLE 1: INACCURATE PRIOR KNOWLEDGE

Before beginning a new module, the learner completes a pre-test to assess his or her prior knowledge. The results from the pre-test will help the learner identify which aspects of his or her prior knowledge are accurate and which are inaccurate.



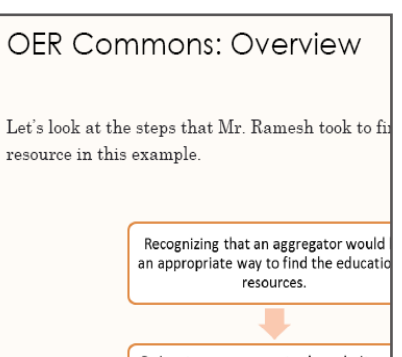
## EXAMPLE 2: SCAFFOLDING

Small hints will be available throughout the course to help the learner who is having difficulty understanding certain concepts. As the learner works through the exercises step by step, the program will be able to isolate and identify what hints are appropriate to help the learner.



## EXAMPLE 3: EXPOSURE IN MULTIPLE CONTEXTS

In order to promote understanding over memorization we present the information in an abstract manner and then provide numerous contextualized examples along with exercises from multiple contexts.



## Related work

Our course is based off the structure of the Open Learning Initiative (OLI) at Carnegie Mellon University. OLI is an online course system where students can take courses in classes such as Statistics, Economics, French, and Chemistry, at their own pace online with repeated practice, assessments, and feedback. OLI's structure aligns with the core learning sciences principles identified as being the most effective for learning.

We have also looked at other standards for information literacy for teachers by international standards bodies such as the UNESCO and the International Computing Driver Licence.

## Future work, vision and experimentation

There is an enormous opportunity for further work in making Bodh a more usable, learning-oriented and learner-focused e-course. A few ideas to do this, include:

### Personalized learning with AI

The exercises and unit tests could change based on which questions the learner answers right. If the user has demonstrated having difficulty understanding particular topics within the module exercises, the unit tests can emphasize those areas more to

make sure the learner has really grasped those concepts.

### Social and collaborative learning

Allowing learners to interact with each other as they move through course, and learn about how and what different members in a community are learning about. There could also be in-built communication features which learners use to interact with one another about the course and also do activities together.

