

# Effect of Practicing Experiential Learning (Like Online Learning - ICT) in Engineering Education

**Mahendra Patil<sup>1</sup>, Mamta Meena<sup>2</sup>**

<sup>1,2</sup>Department of Computer Engineering, Atharva College of Engineering,  
Malad (W), Mumbai, Maharashtra, India

<sup>1</sup>mahendrapatil@atharvacoe.ac.in

<sup>2</sup>mamtameena@atharvacoe.ac.in

**Abstract** The aim of this paper is to explain experiential learning in engineering education by practicing of Spoken Tutorial. Experiential learning is learning from experience or learning by doing which first immerses learners in an experience and then encourages reflection about the experience to develop new skills, new attitudes, or new ways of thinking. It has been observed that the experiential learning through Spoken Tutorial assure the accuracy achievements of increasing employability through active learning. This paper investigates the experiential learning cycle by comparing Teaching Learning via Spoken Tutorial with placement activity of students. Lastly, the authors give the experimental results which give the concept of experiential learning by identifying the environmental and structural effectiveness of the experiential learning process.

**Index Terms**— Experiential Learning, Active Learning, Practicing Experiential Learning

## 1. Introduction

Let us determine best practices in experimental learning (Michelle Schwartz, 2015). (Lewis and Williams, 1994) said that, “In its simplest form, experiential learning means learning from experience or learning by doing. Experiential education first immerses learners in an experience and then encourages reflection about the experience to develop new skills, new attitudes, or new ways of thinking.” In mid centuries transforming from traditional form education in which teachers just elaborates there concepts theoretically but to by performing experience practically students will get more knowledge and sound to the subject. Experiential methodology doesn't treat each subject as being walled off in its own room. Learners play a critical role in assessing their own learning (Wurdinger, 2005). The outcome of person varies from person to person as everyone will get a different experience from learning the subject or content matter practically.

There are some steps which clears the idea of learning in detail (fig. 1):

Step 1: Classroom Learning: Classroom learning is enclosing the experience of students a enriching, dynamic and a valuable theory/practical. In classroom learning students will gain knowledge by teacher.

Step 2: Assignments given in classroom: it will help to students to practicing the knowledge which they acquire in the classroom.

---

**Mahendra Patil**

Department of Computer Engineering,  
Malad (W), Mumbai, Maharashtra, India  
mahendrapatil@atharvacoe.ac.in

Step3: Learning Outcomes: By taking online test or offline test of students, learning outcomes will be calculated.

Step 4: Learning Assessment: Correcting Online tests and offline tests time to time will built ability in students for competition, which is now a days is very important.

Step 5: Learning identity: By correcting Tests and Assignments, teacher will easily find out the weak points of students and after that teacher will give more focus on these points only.

Step 6: Learning Review: After all the above steps, the student will ready to go for further competitive exams, higher studies, or for giving knowledge a practical approach in the industry.

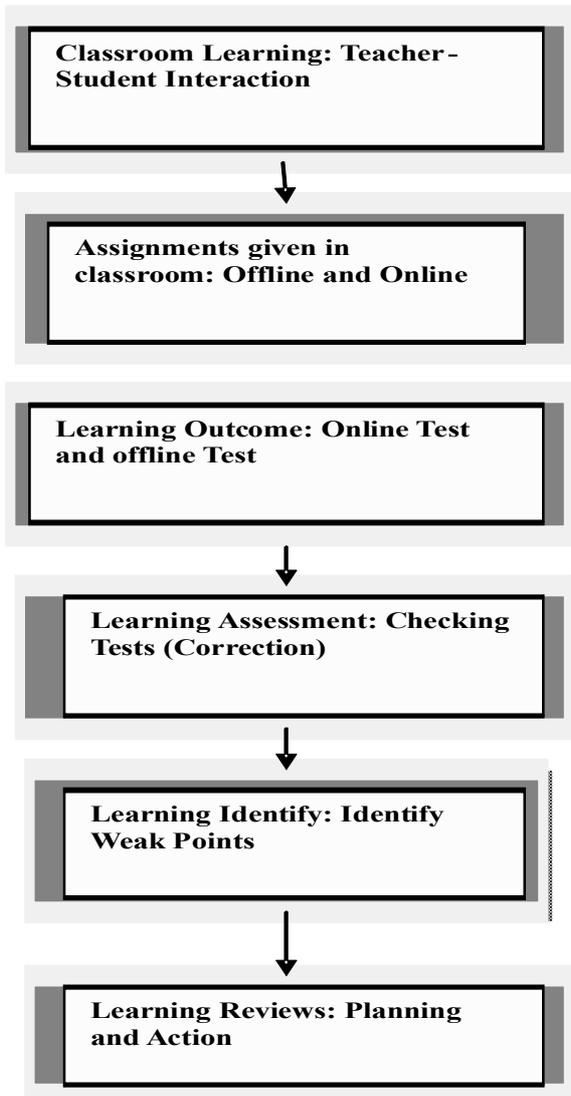


Fig. 1 Effective Learning tool for Students

## 2. Review Of Literature

1. The simplest way to transform your class in a powerful way is we can do active learning strategy, unlike open class discussion. Students learn better when they engage directly rather than absorbing (Yale Center).

A well-designed active learning strategy has the following characteristics:

- a. Every student is acting on the material either individually or with group.
- b. The timeframe is clear.
- c. The goal is clear, meaningful, and uncomplicated.
- d. The task of the activity itself is clear, and uncomplicated.
- e. The nature of the end product be it a list, an answer, a choice, or a structure is described unambiguously.

2. In recent the class room technique has seen an momentum in engineering. class room techniques are easily understandable. A well assessment can provide observable outcome. Therefore assessment should be properly done to get the proper result and proper assessment technique should be designed the program is rolled out. The paper summarizes finding project the impact of assessment method the quality of engineering education (Radhika and V.P.Bhaskara, 2017).

3. Imagine that you have attended a weekend workshop, let's say on team-building. To cater for expected large numbers, there are four different streams on offer, each with a different coordinator. The AITD will then allocate you to as preferred a stream as it can, while still balancing numbers across the four streams. The introductions by the four coordinators are given below. Assume that all coordinators are known to be competent. In all respects, except the actual learning approach, the four options are equivalent (Dick and Bob, 2002).

## 3. Objective Of Practicing Experiential Learning PEL In Engineering Education

Hearing and seeing someone explaining process

will help more to understand it than reading as 20% of communication happens through language rest all is visual gestures. Considering basic rules for effective communication Some Online Tutorials has been developed, where students will find a huge collection of courses related to their streams which will help them to learn, understand, and use open source software(Spoken Tutorial, IIT Bombay)

Concept of Online tutorials has been appreciated by various education institutions, in last decade, as it is encouraging learning in effective way. It's a community based site, where everyone is welcomed for contributions from society like teachers, professors, entrepreneurs, etc. Participant should decide a topic and prepare a detailed video on that for a Online Lectures/ tutorial to upload (Spoken Tutorial, IIT Bombay). Once the video has been uploaded, it will be reviewed by experts for content and quality. Once review process get completed and clear the test, video will be available in public domain to benefit the associated audience. Video will be available in various languages as they promote translation of these tutorials in interest large audience (Spoken Tutorial, IIT Bombay) (Kiran L. N. and Kannan M., 2012)(Kiran L. N. and Kannan M., 2012).

Along with learning, students can do certification through Online Lectures or Tutorial in various software training workshop available. It will enable them to enhance their knowledge in latest technology trend, which will help during placements(Spoken Tutorial, IIT Bombay).

#### 4. The Practice Of Learning & Development

One of the best example is - With the help of IIT – Bombay provided learning material a project has been started by Spoken Tutorial which uses a magical audio-video teaching tool. It is user- friendly tool, which is also proven to be highly conducive and effective for self-learning (Spoken Tutorial, IIT Bombay).

The most exciting part of this process is that student can do certification alone with gaining knowledge for free. They have to clear online exam after completing the course. It would add immense value in individual carrier path may be for student during placements or for professional during promotions.

A variety of training material is available on every

student starting from basic IT skill tools such as LibreOffice (Open Source alternative of MS Office-Word, Excel, PowerPoint), to more detailed programs for computer students like Linux, C++, Java, PHP & MySQL and so on(Spoken Tutorial, IIT Bombay).

All the software for training are free & open source. It will enable student to perform hands on for free. Reference links also available to make sure their easy access with no cost associated for licensing or no threats of using pirated versions. Downloadable version of every software is available on Internet for Free and training is also available through Spoken Tutorials(Spoken Tutorial, IIT Bombay).

#### 5. Example Of Atharva College Of Engineering, Malad West, Mumbai, India Using This Practice

As Atharva College of Engineering was conducted this test through Spoken Tutorial from last three years to train BE students as well as SE & TE students in a large scale.

Received a special word of appreciation from IIT-B in the year 2015-16, the timetable of ACE's Spoken Tutorial Test was shared with other colleges across the state encouraging them to conduct the test on a large scale for increasing online tutorials.

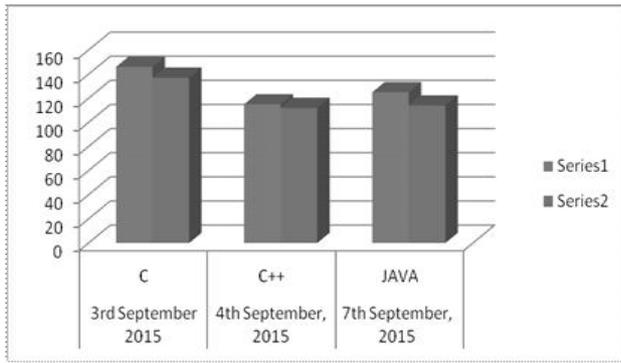
#### 6. Performance experiments: evidence of success of PEL(spoken tutorial exam in the department of computer engineering)

The below tables and bar graphs shows the last three years data of Atharva College of Engineering who was conducted this test through Spoken Tutorial.

##### A. ACADEMIC YEAR 2015-2016

**Table- 1)Online test timetable and detail**

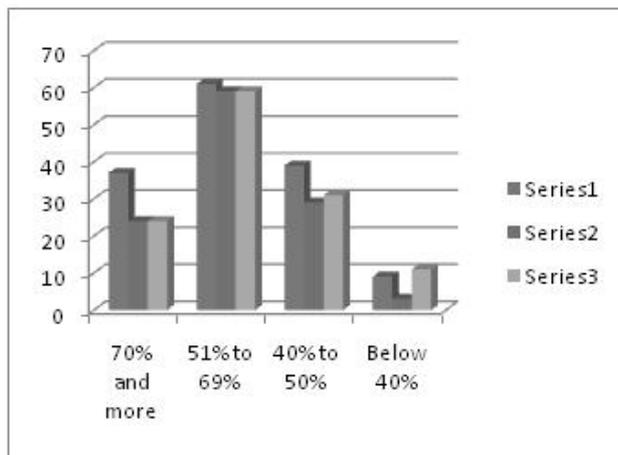
DATE	TEST	No. of Students appeared for Test	No. of Students who cleared the test
3rd September 2015	C	146	137
4th September, 2015	C++	115	112
7th September, 2015	JAVA	125	114



**Fig. 2. Bar charts analysis of course wise in the year 2015-2016**

**Table 2. Online Test Analysis**

Analysis for Academic Year 2015 -16			
Range	No. Of Students in C Test	No. Of Students in C++ Test	No. Of Students in JAVA Test
70% and more	37	24	24
51% to 69%	61	59	59
40% to 50%	39	29	31
Below 40%	9	3	11

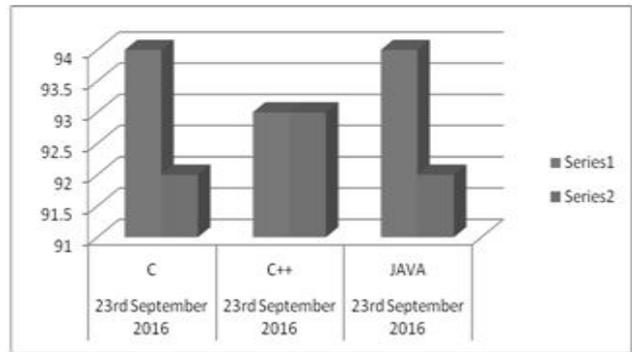


**Fig. 3. Bar charts analysis of Range wise score of students in the year 2015-2016**

**B. ACADEMIC YEAR 2016-2017**

**Table 3. Online Test Time Table And Detail**

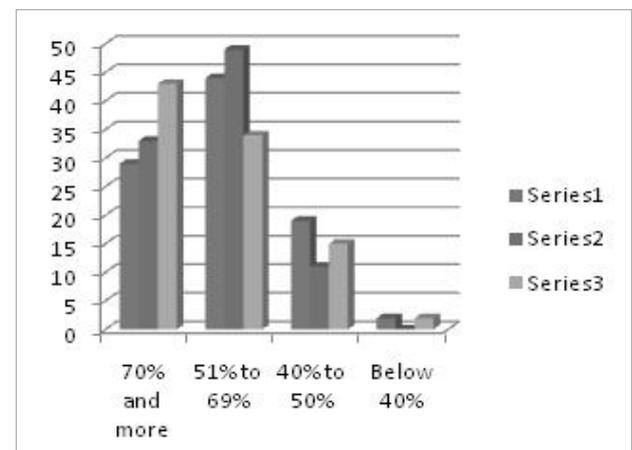
DATE	TEST	No. of Students appeared for Test	No. of Students who cleared the test
23rd September 2016	C	94	92
23rd September 2016	C++	93	93
23rd September 2016	JAVA	94	92



**Fig. 4. Bar charts analysis of course wise in the year 2016-2017**

**Table 4. Online Test Analysis**

Analysis for Academic Year 2016 -17			
Range	No. Of Students in C Test	No. Of Students in C++ Test	No. Of Students in JAVA Test
70% and more	29	33	43
51% to 69%	44	49	34
40% to 50%	19	11	15
Below 40%	2	0	2



**Fig. 5. Bar charts analysis of Range wise score of students in the year 2016-2017**

**C. ACADEMIC YEAR 2017-2018**

**Table 5. Online Test Timetable And Detail**

DATE	TEST	No. of Students appeared for Test	No. of Students who cleared the test
11th, August 2017	C	98	89
11th, August 2017	C++	95	87
11th, August 2017	JAVA	93	79

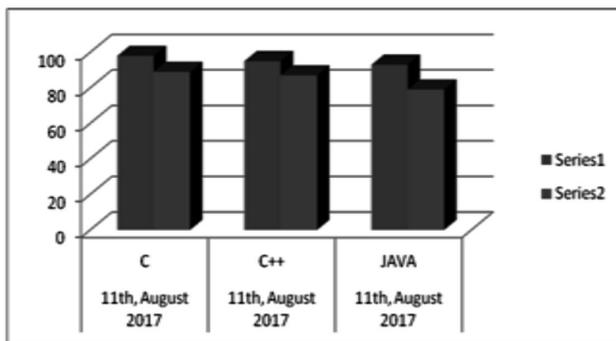


Fig 6. Bar charts analysis of course wise in the year 2017-2018

Table 6. Online Test Analysis

Analysis for Academic Year 2016 -17			
Range	No. Of Students in C Test	No. Of Students in C++ Test	No. Of Students in JAVA Test
70% and more	30	40	26
51% to 69%	42	32	31
40% to 50%	17	15	22
Below 40%	9	8	14

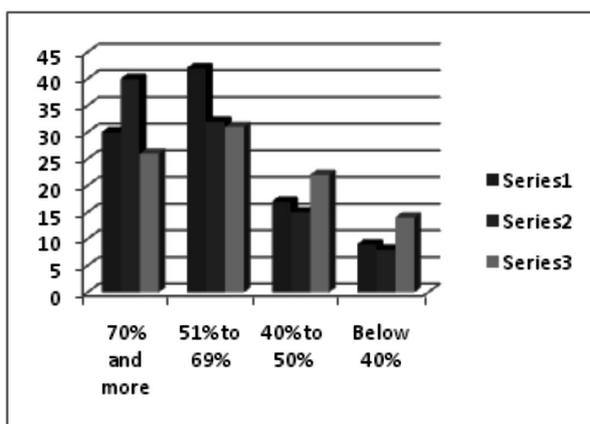
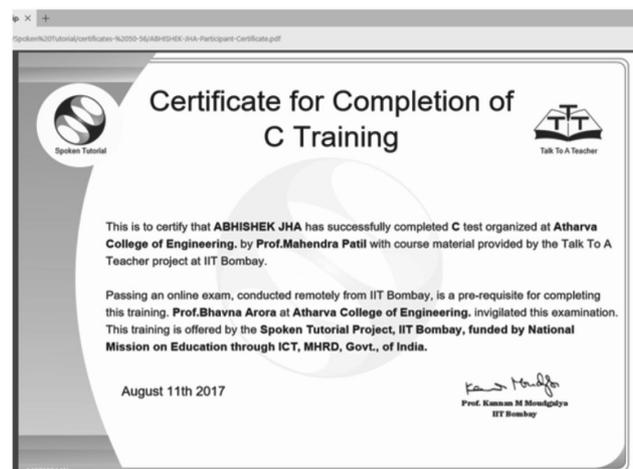


Fig. 7. Bar charts analysis of Range wise score of students in the year 2017-2018

Certificate is the achievement which student got in spoken tutorial exam

### 7. Problems Encountered And Resources Required For Online Learning Or Practicing

Need Computer Labs with internet Connection with a good speed. For spoken tutorial the training is via self-learning so one does not need to leave the campus. It is offered totally FREE of COST, as it is funded by the Govt. of India. In the beginning, Teachers will guide



and support the learners, once familiar with the method, all can learn. After learning and practicing the tutorials the student becomes knowledgeable enough to take an online assessment test. Learners receive Spoken Tutorial Projects, IIT Bombay certificates on clearing the test(Spoken Tutorial, IIT Bombay).

### 8. Good Thing About Practicing Experiential Learning PEL : Spoken Tutorial In Engineering Education

Spending thousands of rupees to learn computers and software is a history! An MHRD Govt. of India project, 'Spoken Tutorial' makes it possible for everybody to learn software, without paying a single rupee. Learners need not travel, need no special trainer, no teachers etc. The most exciting part is, not only the students will gain knowledge for free, they will be awarded certificates after an online exam, which would be of immense value during placements or promotions(Spoken Tutorial, IIT Bombay)(Kiran L. N. and Kannan M., 2012)(Kiran L. N. and Kannan M., 2012).

### 9. Summary And Analysis Of The Online Feedback For Practicing Experiential Learning PEL

After the completion of learning tests, an online feedback was taken from the students using the Google forms. The feedback form covered various aspects right from the productivity of the test and how much it helped the students in assessing themselves in terms of their technical capability in the languages C, C++ & JAVA. There was provision for giving remarks & suggestions as to how to improve the test further for the upcoming batches.

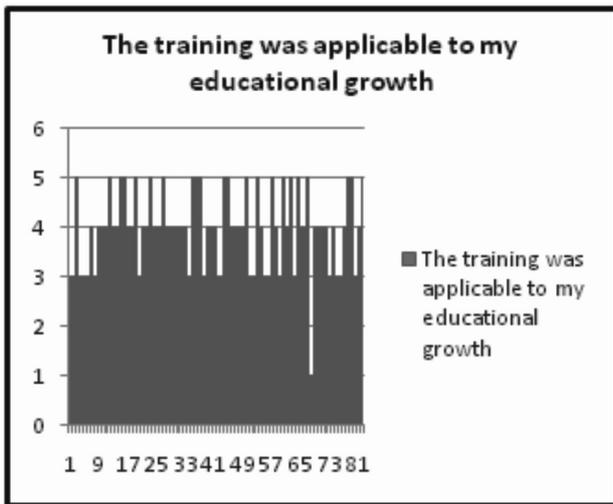


Fig 8. Bar charts analysis of feedback of students in the year 2017-2018 (students agreement on “the training was applicable to their educational growth”)

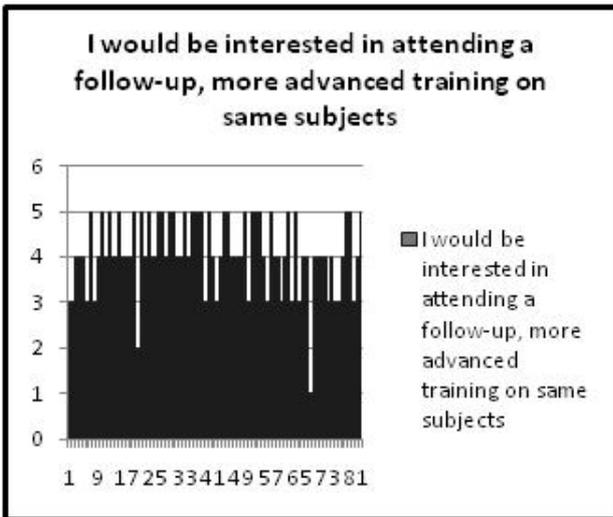


Fig 9. Bar charts analysis of feedback of students in the year 2017-2018 (student's agreement on “They would be interested in attending a follow-up, more advanced training on the same subjects”)

**10.Impact Of Practicing Experiential Learning PEL On Engineering Education (On Placements)**

As a result of the activity, the students testified about their increase in self-confidence and were able to work on the technical topics that they were weak and prepare well for the placements. The placements for the last three current academic years are

Placement Record for the Academic Year 2014-2015  
Summary:

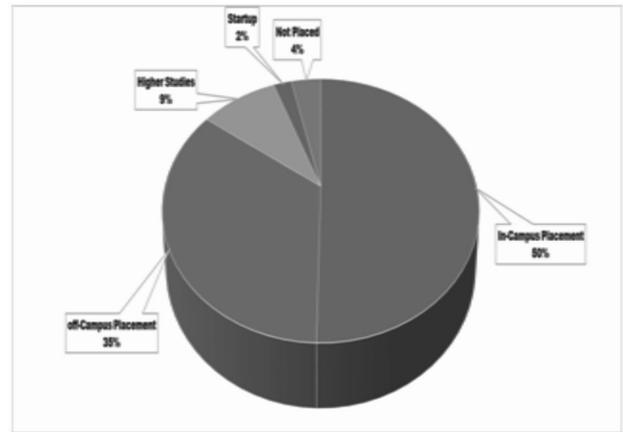


Fig 10. Pie chart analysis of placement of students in the year 2014-2015among 146 students

Placement Record for the Academic Year 2016-2017  
Summary:

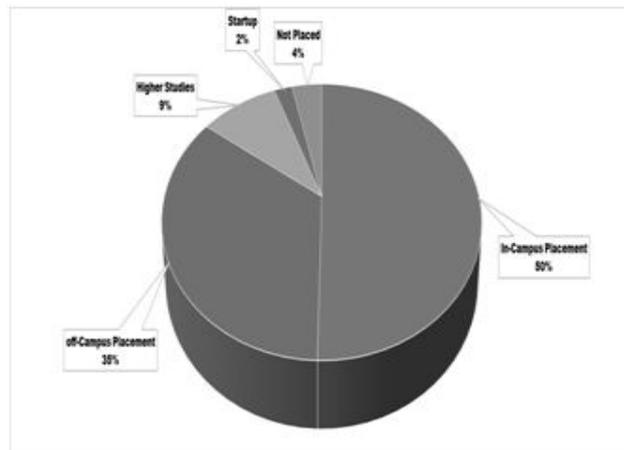


Fig 12. Pie chart analysis of placement of students in the year 2016-2017 among 169 students

**11.Conclusion**

There is a direct impact on student's approaches to learning by the nature of assessment used by the teachers. Practicing the experiential learning helps the students to get technical or practical knowledge in their core subjects. The continuous implementation of teaching learning approach via spoken tutorial activity is the best method of assessment for students are more likely to restate the knowledge acquired. Hence, active learning actually enhances the employability of the students.

## 12.Future Plans

The impact of such sessions on the employability of a student is high. Hence the department plans to extend this online training activity that will boost their employment opportunity for Third year and Second year students.

## References

Michelle Schwartz (2015), Best Practices in Experiential Learning, The Learning and Teaching Office, 1-20.

Lewis, L.H. & Williams, C.J. (1994). In Jackson, L. & Caffarella, R.S. (Eds.). *Experiential Learning: A New Approach* (pp. 5-16). San Francisco: Jossey-Bass.

Wurdinger, S.D. (2005). *Using Experiential Learning in the Classroom*. Lanham: Scarecrow Education.

Yale University, *Increasing Critical Thinking and Motivation*, Chapter 4, Yale Center for Teaching and Learning.

Radhika Devi, V.P.Bhaskara Reddy, (2017). RISE–The Pillars of Quality Assessment (Review, Identify, Strengthen, Evaluate), *Journal of Engineering Education Transformations*, Volume 31, No.1, July 2017, ISSN 2349-2473, eISSN 2394-1707

Dick, Bob (2002), The design of experiential learning activities. Unpublished paper (mimeo). A handout on experiential learning, itself designed as a miniature experiential learning activity.

Spoken Tutorial, IIT Bombay, <http://spoken-tutorial.org/about-us/>

Kiran L. N. Eranki, Kannan M. Moudgalya (2012), Evaluation of student perceptions and interests using Spoken Tutorials in online courses, 2012 12th IEEE International Conference on Advanced Learning Technologies

Kiran L. N. Eranki, Kannan M. Moudgalya (2012), Evaluation of Web Based Behavioral Interventions using Spoken Tutorials, 2012 IEEE Fourth International Conference on Technology for Education