Auto-Didactic Learning Framework Based Content Development for Learning English Effectively in Engineering Classrooms

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Abstract

Content development in design of a curriculum decides the “Scope” and “Sequence” of the curriculum. It has the capability to touch upon the lives of learners by exposing them to possible wide arrays. Studying engineering in this decade with sophisticated technological advancements needs to be given more autonomic and cognitively exciting learning tasks and materials. “Cognitive ability” of an individual determines the level to which “learning” and as its result “understanding” and as its result “application” shall happen. Authors of this paper are of view that through proper attention and ideological emphasis, content development can be made use as a tool for making students to learn better. The authors propose a new learning frame work “Auto-didactic learning” and supplement the self-directed learning through selection of proper cognitively exciting contents through the principles of Instructional Design. The authors disserts various platforms which tests the student’s English language skill and comprehension and derive a pattern which serves as the base for the hypothesis. Atomistic approach on Content development through Auto-didactic learning for those testing mechanisms is followed and authors demonstrate at all the possible points about mapping it with “Process” and “Product” in Curriculum Design and Development.

Keywords: Content development, curriculum design, Auto-didactic learning, English, Engineering class rooms.
Introduction

Learning a subject for a purpose depends upon the importance and necessity. Whereas, the depth of learning and retention depends not only upon purpose but also on the content, it is of equal importance to focus on content development along with designing a curriculum for learning. This paradigm attains much significance with the context of learning English as a tool of communication. This paper calls for increasing learner’s autonomy for better learning of English in Engineering classrooms with reference to affiliated colleges under Anna University of Technology, Chennai, Tamilnadu, India.

Curriculum design and Content Development

Each stage of a curriculum designing process should consider earlier knowledge and achievements of the learners. Learners should be able to progress at a pace attaining their requirements and propensity. Progression in learning experiences and outcomes of learning will impact on knowledge acquisition and application system which in turn completes the purpose and process of learning. Curriculum developers must be concerned about the contents within the curriculum. While focusing on content or subject matter, learning experiences that learners will experience as a part of the process is to be considered. To achieve this along with developing course objectives, the expected behavioural objectives of learning process need to be evolved. This will act as a road map for implementing curriculum. Thus developing contents play a significant role in accomplishing intended objectives of a curriculum designed for English in Engineering classrooms.

English in Engineering Classrooms

English has taken deep roots in India. It is no more a typical English spoken in England or in the United States but has acquired an Indian character. Such evolution is not limited to the urban population base, but it is happening across the semi-urban and rural India as well. With the advent of Telecommunication Industry and the Information Technology Enabled Services (ITeS) Industry, along with the big role Indians have played in the development of computers and software industry globally, the opportunities are galore for the English speaking Indians.

Knowledge is the key resource for global competitiveness. The processes of liberalization, privatization and globalization (LPG), along with technological revolution have further strengthened the significance of a knowledge-based society. Education has multiplied the role of English language in a globalized context, because universities worldwide often use English as the common mode of learning and communication. Engineering graduates require an ever-increasing range of skills to maintain relevance with the global environment of the new millennium (UNESCO 2007). In Engineering classrooms, English is learnt as a language under specific pattern called English for Specific Purposes (ESP). There is a clear necessity for effective English communication skills for Engineers in the current globalized environment. The growing popularity of engineering education and seeking employment in Multi-National Companies have boosted the technical students to use English language for both academics and professional communication. Thus English in engineering classrooms is taught and learnt as communicating tool.
Cognitive ability and Communication

Cognitive ability is a set of mental abilities and processes related to knowledge, memory, judgment, reasoning and "computation", decision making, comprehension and production of language (Wikipedia). Human cognition is intuitive (like knowledge of a language) and conceptual (like a model of a language). Cognitive ability uses existing knowledge and generates new knowledge (Blomberg 2011). Developing the ability to communicate effectively with languages is a subset of cognitive ability by this regard. Our ability to use language relies on the use of recognised systems and symbols and a common understanding of what those symbols mean. To upgrade one's ability to communicate better in a language, his/her ability of understanding, knowledge and retention stages momentous responsibility are worth considered. Thus it could be concluded that to teach one to enhance his ability to communicate better, contents developed or contents identified should be able to excite cognitive functions. Accordingly, curriculum must be designed and implemented. Curriculum must be able to pose challenges to the learner's potential. As rightly pointed by psychologist Albert Bandura “The stronger perceived self-efficacy, higher the goals they set for themselves, firmer is their commitment towards to them” (Bandura 1991), contents in the curriculum must provide a space for the learner to enhance the learning, but also his ability to learn along with his belief that he can learn. Thus cognitive excitation must be achieved through implementing the well defined curriculum.

Evolution of English curriculum in engineering classrooms

In most of the ELT class rooms in India conventional teaching methods, materials and techniques based on prescribed texts and syllabus are used homogeneously despite differences in class rooms and level of students. The traditional methods which largely depend on lecturing and rote learning fail to develop language skills as competency among learners. When learning turns out to be monotonous and creates distaste, outcome of the learning will be reduced to passive reception. Use of novel teaching techniques like miming, dramatics, creating novel activities and tasks and participating in the same and use of authentic material are considered by the teachers to involve learners directly in the learning process. Thus English curriculum for engineering students under affiliated colleges of Anna University of Technology, Chennai got its emphasis focused on skill development rather than knowledge acquisition. The course objective is to enable the students of engineering to learn certain macro- and micro-skills in the English language and use them effectively as students while following other courses and later as engineers/technologists at the work place. Hence emphasis on English curriculum got in to various modifications such as Task Based Learning; Outcome based learning, Skill acquisition through learning, Collaborative learning and so on. Recent developments such as Tailor made courses on language skills acquisition, communication skills development, soft skills enhancement stands as illustrations to the evolution of curriculum for English in engineering classrooms.

Auto-didactic learning framework

Auto-didacticism is the act of self-directed learning about a subject or subjects in which one has had little education (Armstrong 2012). A recent trend in education calls for environment caters towards students’ individual needs, goals and interests. This model adopts the idea of inquiry-based learning
where students are presented with scenarios to identify their own research, questions and knowledge regarding the area. As a form of discovery learning, students in today’s classrooms are being provided with more opportunity to “experience and interact” with knowledge (Chissom 1992). Successful self-teaching requires self-discipline and reflective capability. Sustaining the self-learning process is arduous task as it lies much with the domain of learner and sound psychological interventions are required to effectively pursue with self-directed learning. In order to sustain the learning process under this mode, learning objectives (LO) needs properly set at appropriate stages with split-up’s with learner’s choice. Whenever learner finds it difficult to sustain with self-learning, the learning structure should provide space for identifying the causes and highlight the consequences. Prior to begin the learning process, ‘threshold level’ where the learning can be stopped should be identified and the learner shall decide to learn further involving his Higher Order Thinking skills and other subsets of analytical skills and logical decision making. Following depicts the diagrammatic expression of “Auto-didactic learning framework”, a diagrammatic structure of the above point

Another Subject / Topic

Figure: Learning Frame work suggested for Auto didactic learning
**Framework - Curriculum – Content – Mapping**

The above framework is an outcome of integrating various components and stages of learning. The implementation of Autodidactic learning involves various aspects and components of curriculum. Since this framework calls for more space with regard to learner’s choice, decision making, learner’s autonomy gets significant attention. The challenges in enlarging learner’s autonomy with respect to learning emerge from the points of sustainability, minimally invasive learning environments and Meta cognition. Without subsiding these challenges, implementing syllabus or curriculum under this module will not yield desirable results. Anticipating all these challenges in advance will avail an opportunity to overcome those challenges through proper content development. Along with the contents, few structural provisions through tools such as

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>View</th>
</tr>
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<tbody>
<tr>
<td>Pre Learning</td>
<td>Ideas on What, Why, How to learn</td>
<td>Atomistic</td>
</tr>
<tr>
<td>Intended Learning objective (ILO)</td>
<td>Holistic objective of the learning</td>
<td>Holistic</td>
</tr>
<tr>
<td>Sectional Learning Objective (SLO)</td>
<td>Sub sectionals’ learning objective</td>
<td>Atomistic</td>
</tr>
<tr>
<td>Learning Materials Inventory (LMI)</td>
<td>Inventory of learning materials</td>
<td>Atomistic</td>
</tr>
<tr>
<td>Key Learning Outcome (KLO)</td>
<td>Holistic outcome of the learning</td>
<td>Holistic</td>
</tr>
<tr>
<td>Threshold Intervention (TI)</td>
<td>Outcome intervention of the learning</td>
<td>Holistic</td>
</tr>
<tr>
<td>Higher Order Learning Objective (HLO)</td>
<td>Holistic objective for higher order learning</td>
<td>Holistic</td>
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These tools shall be properly used at paced intervals in order to ensure dynamic contents enabling the learners to learn effectively under auto-didactic mode. Learning materials inventory (LMI) partially enlarges the autonomy of the learners as it should be also filled up with the choice of learner’s. Higher Order Learning Objective (HLO) sets ground for progressing with learning on that particular intrest with his own materials inventory. Transition from *learning* to *Higher Order learning* succeeds Threshold Intervention (TI), where the learner will check for his accomplishment of primary learning objectives. It is here where ‘self-efficacy’ play a role. At Threshold Intervention, learner will decide on learning further on the subject. In this regard, when the frame work gets tested for one of the four English Skills, ‘Listening’ through ‘Reading comprehension’, following shows the implementation of Auto-didactic Learning Framework for teaching-learning ‘Listening-Comprehension skills’
Thus ‘Auto-Didactic Learning Framework’ gets mapped with curriculum with special emphasis on content development for learning English effectively in engineering classrooms. Since English is to be learned as a skill in engineering classrooms, the content through which skill is taught ‘TED Talks’ in this reference assists the development of self-efficacy of the learner. Thus skill is just not being taught, but taught effectively through developed dynamic content.

References
