Framing a need based syllabus using science fictions to enhance the language competency of engineering students - A pragmatic study

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ABSTRACT

The purpose of the study is to design a framework of syllabus to teach and develop study skills of students in the context of English for Academic Purposes (EAP) with a special focus on the language needs of target group- engineering Students belonging to Karunya University at Coimbatore, employing the linguistic and thematic components of a science fiction titled 'Star fish' by Peter Watts. Unlike the ordinary science texts generally prescribed by EAP theorists and ESP/EAP teachers, science fictions as course material would make the learning process interesting, and simultaneously would enhance the study skills much needed for the professional success of the Engineering students.

Introduction

The impetus for the study emerged on observing the engineering students' class room performances in tests and also during any other academic or non-academic activities. While conversing with them and on reading e-mails and the letters they draft to the higher officials seeking permissions or requesting for the issues of certificates, it has been realized that their language, employed in both speaking and writing, needed refinement grammatically and also in discourse arrangement. This observation has been an encouragement to the Researcher to analyse the needs of students at Karunya University in terms of EAP under the category of needs analysis using interview and questionnaire strategies and finally design a need based curriculum that shall enhance their language competency and enable them to excel during their career as engineering students and in future as professionals in academic and technical institutions.

It has been a practice among the ESP/EAP theorists during their process of course designing to lay emphasize on needs analysis from a student learner perspective. Mostly an engineering student has been the subject of their study ever since ESP originated. (Hutchinson & Water,1987). It is discovered that the technical students' necessities, wants, needs and demands (Jordon, 1998) in terms of language learning process are specific and aim towards academic and professional success.

Unfortunately, in Indian Institutions where all the subjects are taught only in English, the syllabus for English course is not taken seriously by the students' community. They study only with an intention to secure marks in end semester examinations.

This complacent attitude has its impact on them affecting their performance. English Teachers, whose responsibility is comparatively large in imparting study skills in other words the academic skills, feels embarrassed when his/her students fail in exams or interviews or in other academic related challenges. Yet it cannot be denied that Syllabus materials prescribed in technical institutions are too theory oriented and uninteresting. To resolve this issue of non compliance of engineering students, English Teachers ought to assume the role of ESP/EAP practitioners (Hutchinson &Water, 1987) preparing an ESP/EAP syllabus meeting the academic needs of students -as learners and users of English language - exercising the autonomy given to them in private institutions.

Needs Analysis

EAP is considered to be a part of ESP that aims at teaching English to those who need to learn it for specific purposes. (Hutchinson and Waters, 1987). According to Jordon(1997) EAP is associated with study skills needed for learners' better performances in academic situations and activities. EAP practitioners consider need analysis as the criteria to offer courses for learners with specific academic need . (Robinson, 1991). Mostly they design curriculum after analyzing either target needs or learning needs. According Hutchinson & Waters, target needs are defined as 'what the learner needs to do in the target situation' and learning needs are "what the learner needs to do in order to learn' (54). They categorize target needs into three aspects- necessities, lack and wants. *Necessities* is the type of need determined by the learners needs or demands to "function effectively in target situations"(55). *Lacks* are the determination what is necessary for a learner, what he already knows and what he at present lacks.(56).

Wants are what "the learners view as to what their needs are"(57). To satisfy the learners and the sponsors is the prime step of the course designing process, and the main job of the English teacher is to be and also to make the learners, aware of their necessity (Hutchinson and Waters,1987) to learn English under different target situations.

Jordon also strongly believes that needs analysis is "the starting point for devising syllabuses, courses, materials and the kind of teaching and learning that takes place."(22). He incorporates various approaches other than what are suggested by Hutchinson and Munby under the umbrella of needs analysis: present-situation analysis, deficiency analysis, strategy analysis, means analysis, language audit and constraints. However a through observation of the terms used by Jordon suggests that all the approaches he has mentioned could be grouped under what Hutchinson and Munby propound as necessities for Needs analysis.

Methodology for data collection

With this proposition, the target needs of the Engineering students were analysed using the methodology recommended by Jordon:
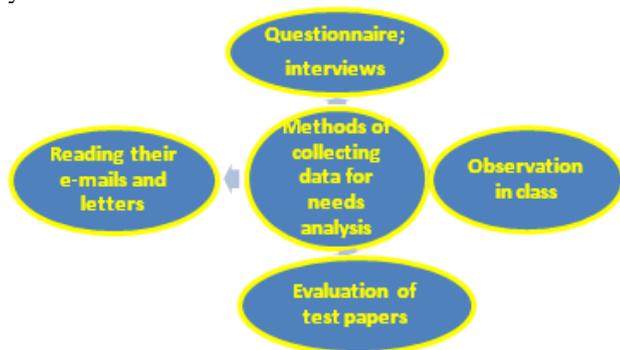
From the data collected and the interview conducted with the engineering students, the teacher researcher identified the following necessities (Table-1) based on Munby' s of Communicative Needs Processor (CNP) and Jordon's identification of study situation (target situation)

Table 1. Necessities of Engineering students in an academic environment.

Communication activities	Micro-functions
Academic Speech To speak/talk/ ask doubts formally with the teachers, authorities and peer group	Answering to questions Convey message Probing /Giving/ responding to Instructions and Directions
To deliver structured speeches and make oral presentations in class rooms and during conferences and seminar.	Listening &note taking Asking and answering questions; For repetition; clarification; information; Agreeing and disagreeing; Explaining and stating points of view ;Giving reasons; Interrupting; Initiating comments; Verbalsing data
To overcome the influence of the mother tongue and to learn appropriate pronunciation.	Pro Speaking/ lecturing/ presenting papers in a comprehensible Manner Pronouncing the words intelligibly
Academic writing To write formally without grammar mistakes.	Letter writing,, E-mail, Memo, Minutes, General /Specific Reports for academic purpose and for Newspapers

Next category of target needs is to identify what the student learner wants and lacks. It is clear from the study carried out through observations and the interviews conducted the students. They are aware of what they want and also what they lack. The details are given below in the tabular form (Table-2).

Based on the above details, an EAP syllabus - a goal-oriented one, flexible and beneficial for the development of study skills is designed using the genre of science fictions in the form of books and movies to make the learning process interesting and at the same time making academic career successful.. The learners would not find the study materials monotonous and boring like their regular text books used in regular class rooms. Simultaneously it gives opportunity for them to acquire the following academic skills related to subject knowledge:

Study skills	Academic situations	What the students want	What the Students lack
Reading	Reading text/reference books for tests/ collect information	Prediction, recognizing functions of sentences reading for general/ specific information distinguishing between factual &non factual information vocabulary development	Comprehending the terms & concepts; Learning vocabulary; Timely usage of vocabulary; grammatical formation of sentences; asking and answering questions
Speaking/ Listening	Class room activities/ Outside class room / Oral presentation/ Conversation/ discussion/ Speaking/ Conversation	asking doubts answering questions using appropriate vocabulary conversing freely with their peer group about a familiar subject	speaking without grammatical errors; explaining / informing convincingly; discussing a topic related to subject; pronouncing appropriately; using discourse markers ; expressing feelings, thoughts and emotions coherently and without any inhibitions using relevant words and phrases
Writing/ Internal and external forms of communications	Requisition/ Conveying information Research work/	writing contextual letters /e-mail writing analytical reports preparing project proposals writing articles for publication	writing in the right format without grammar or spelling errors restraining from using slang/ colloquial terms, using appropriate terms, organizing the materials according to its genre, using discourse markers and relevant connectives, sequencing ideas, giving sign posts,, writing research articles for Seminar/ conference/ publication

Significance of science fiction as a pedagogic tool to enhance scientific knowledge.

● Identifying various ranges of applications, theories, concepts and fictions added by the author
● Gathering information related to the concept used by the author from various sources.
● Establishing connection between different engineering fields.
● Introducing one's own hypothesis for research
● Collecting images and making videos relevant to subject
● Discerning the benign and malign impacts of the science factors mentioned.

Thus we find science fictions help in bringing affront ones aptitude towards scientific career as an engineering student, teacher engineer, a researcher or a professional equipped with proficiency to read and comprehend contextually the meanings, identifying the structure of the discourse, building of vocabulary formal and informal, developing technical knowledge, analyzing logically and exploring and inquiring facts and fantasy with a research mind.

To illustrate how science fiction can be used as text materials for acquiring study skills, excerpts from a popular science fiction *Star fish* written by Peter Watt, a marine biologist is taken as a sample for the study:

Star fish

…Beebe Station floats tethered above the seabed, a gunmetal-gray

Planet ringed by a belt of equatorial floodlights….

"I heard something out there," Ballard says. "I just wanted to make sure you were—"

"I'm fine," Clarke says. "Just a fish."

"They never learn, do they?"

"No. I guess not. See you later."

"See—"

Clarke switches off her receiver. *Poor stupid fish.* How many millennia did it take for them to learn that bioluminescence equals food? How long will Beebe have to sit here before they learn that electric light doesn't?

We could keep our headlights off. Maybe they'd leave us alone She stares out past Beebe's electric halo. There is so much blackness there. It almost hurts to look at it. Without lights, without sonar, how far could she go into that viscous shroud and still return?

Clarke kills her headlight. Night edges a bit closer, but Beebe's lights keep it at bay. Clarke turns until she's face to face with the darkness. She crouches like a spider against Beebe's hull. She pushes off…..

Clarke looks up. Piccard Station is anchored on the Galapagos Rift; it is not a particularly stable mooring.

"You ever meet the couple there?" Ballard asks. "Ken Lubin, Lana Cheung?"

Clarke shakes her head. "They went through before me. I never met any of the other Rifters except you."

"Nice people. I thought I'd call them up, see how things were going at Piccard, but nobody can get through."

"Line down?"

"They say it's probably something like that. Nothing serious. They're sending a 'scaphe down to check it out."

Maybe the seabed opened up and swallowed them whole, Clarke thinks. *Maybe the hull had a weak plate—one's all it would take*—Something creaks, deep in Beebe's superstructure. Clarke looks around. The walls seem to have moved closer while she wasn't looking.

"Sometimes," she says, "I wish we didn't keep Beebe at surface pressure.

Sometimes I wish we were pumped up to ambient. To take the strain off the hull." She knows it's an impossible dream; most gases kill outright when breathed at three hundred atmospheres. Even oxygen would do you in if it got above one or two percent. Ballard shivers dramatically. "If *you* want to risk breathing ninety-nine percent hydrogen, you're welcome to it. I'm happy the way things are." She smiles. "Besides, you have any idea how long it would take to decompress afterwards?"

In the Systems cubby, something bleats for attention. "Seismic. Wonderful." Ballard disappears into Comm. Clarke follows.

An amber line is writhing across one of the displays. It looks like the EEG of someone caught in a nightmare.

"Get your eyes back in," Ballard says. "The Throat's acting up." They can hear it all the way to Beebe; a malign, almost electrical hiss from the direction of the Throat. Clarke follows Ballard towards it, one hand running lightly along the guide rope. The distant smudge of light that marks their destination seems wrong, somehow. The color is different. It *ripples.*They swim into its glowing nimbus and see why. The Throat is on fire.

Sapphire auroras slide flickering across the generators. At the far end of the array, almost invisible with distance, a pillar of smoke swirls up into the darkness like a great tornado.

The sound it makes fills the abyss. Clarke closes her eyes for a moment, and hears rattlesnakes.

"Jesus!" Ballard shouts over the noise. "It's not supposed to *do* that!"

Clarke checks her thermistor. It won't settle; water temperature goes from four degrees to thirty eight and back again, within seconds. A myriad ephemeral currents tug at them as they watch.

"Why the light show?" Clarke calls back.

"I don't know!" Ballard answers. "Bioluminescence, I guess! Heat-sensitive bacteria!"

Without warning, the tumult dies.

Using the above excerpt from the novel a syllabus could be framed. The syllabus is supported with Annexure that explains the type of worksheets /exercises that could be given to enhance the competency level of all the skills related to language and literature of the text prescribed.

KARUNYA UNIVERSITY

Department of English

Course Syllabus

Course Name : Academic English

Course Co-ordinator & Instructor: Dr.M.Poonkodi

Position: Assistant Professor

Office Phone: 0422-2614481

Email: Poonkodi@karunya.edu

Duration: 4 weeks (25 hrs)

Course Objective:

● To enhance the academic/ professional skills through appropriate language training based on target needs of the engineering students using EAP/EASP/EGAP Components

● To develop the language competency of the engineering students

● To motivate the students to become scientists   I Reading comprehension and note-taking skills   9hrs

1. Prediction- predicting the theme of the fiction; attitude of the author; approach of the central character

2. Recognizing different functions of sentences

3. Reading for general /specific ideas

4. Distinguishing between factual and non-factual; real and unreal
5. Vocabulary development
II   Speaking/ listening in academic and non-academic situations
 8 hrs
1. Speaking /listening during lectures/ speeches:
2. Conversation with peer group
3. Oral presentation
4. Seminar
III Academic Writing   8hrs
1. Technical Report.
2. Project proposal
3. Letter writing
4. Essay writing
Annexure –I
 I Reading comprehension and note-taking skills   10 hrs
1. Prediction- predicting the theme of the fiction; attitude of the author; approach of the central character
Egs.
a. Facts about   ocean and the creatures in the ocean, establishment of a research
b. station, difficulties of a woman associated with the station etc.
c. Author exposes his marine knowledge; creates interest defining the intrinsic
d. aspects of the ocean and the technicalities of the station;
e. Dare devil approach of a single woman and her experiences in the
f. unphathomable ocean.
2. Recognising different functions of sentences
Interrogative; imperative ; assertive; negative; exclamatory sentences; direct and
indirect forms of utterances; tag questions; active and passive voice
Egs.
a. Tag questions- "They never learn, do they?"
b. assertive sentences- "I heard something out there," Ballard says. "I just wanted to make sure you were—"
c. Interrogative- "Besides, you have any idea how long it would take to decompress afterwards?”
3. Reading for general /specific ideas
Egs..
a. General details about ocean and the creatures living in it
b. Specific information about the particular part of the ocean/ research station /   types of fish
4. Distinguishing between factual and non-factual; real and unreal
Egs.
a. Experiments carried out on the hydraulic vent underneath the ocean on the surface of the earth down
b. Experiments carried out to trace the sunken ship, drowned plane
5. Vocabulary development
a. Formation of grid for the following words
Eg.
Light : smudge of light; nimbus; halo; flickering light; flood light; amber line;

	blaze	shimmer	gleam	flash	sparkle	flicker	radiance	shine
Light			x	x		x		
Halo					x		x	
Nimbus					x		x	
Amber line	x							x
Flood light	x			x				
Stars		x			x			x
Fire	x							
Twilight			x				x	
Sun	x							
Moon							x	x
Corona							x	
Aura							x	

a. Word network :
Eg. Ocean; research in the ocean ; tools for research under the ocean ; creatures in   the ocean; human being in the ocean; atmosphere in the ocean; people involved with ocean
b.

WORD NET
Topic-Ocean
Sub topic- Research in Ocean
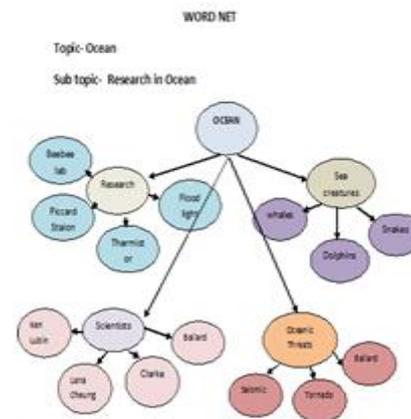
b. Nouns
Names of Chemical substances, physics apparatus-electrical devises, life Saving Devices used in water, devices used to kill etc.
Egs. :
Sonar, Headlight, Thermistor, Bioluminescence,
Millennia Heat-sensitive bacteria, Gun metal- Gray planet
c. Verbs (+ prepositions)
Egs.:
Swirls up, writhing across, pumped up, stares out,
switches off, decompress afterwards etc.
d. Adjectives, adverbs, etc.
Egs.
equatorial floodlights ; electric halo; glowing nimbus myriad ephemeral current, running lightly, slide flickering across.
g.. Abbreviation
 Eg.
 EEG
e. Parallelism
Eg.
Abyss in water; oasis in desert
f. New words -identifying the professionals and their nature of duties
 Egs.
 i. one who studies about rocks-geologist
 ii. one who studies about –oceanographer/marine scientist

iii.one who studies about earth quake- seismologist

iv.one who studies about hydrothermal vent in the ocean floor- geochemist

v.one who studies about marine creatures- marine biologists

vi.one who studies about sky and stars- astronomer or astrophysicist

vii.one who studies about volcanoes- volcanologist

IISpeaking/ listening in academic and non-academic situations

1. Speaking /listening during lectures/ speeches:

Listening carefully, taking notes, asking and clarifying doubts about the theme, plot, scientific details, enquiring the teacher about the content and establishing co relation between the materials prescribed and matter known from external resources; answering questions, speaking without grammatical errors, accuracy in pronunciation.

Egs.

a. Lecture on star fish, marine world etc; response to teachers lectures.

b. Lecture on Hull and its kinds – submarine hull; tear-drop hull

c. Narration of the story chapter wise

2. Conversation with peer group:

Formal/informal speech, Pronunciation, Intonation, Dialogue Practice, Avoiding slang/colloquial language

Egs.

a. Discussion on Marine technology, research carried out in ocean, submarines used at the time of war, programme watched in National Geographic/ Discovery channels/ Books/ Movies

b. Discussion on the subject referring to specific terms - 'bioluminescence', heat sensitive bacteria , devices installed in research station etc.

c. Role play- Conversation between benevolent and malevolent characters, friends colleagues etc.

3. Oral presentation

Organising the presentation, speaking from notes, using bullet notes, signals, fluency in language, accurate pronunciation, error free deliberations

Egs.

a. Research station underneath the ocean- purposes, impacts

b. Adventures of the major and minor characters

4. Seminar

Organising the speech- presenting the speech using notes; responding to doubts; supporting and challenging the views of other speakers.

Egs.

a. Review of 'Star Fish'

b. Oceanic Threats

c. Corporate greed and mismanagement with reference to 'Star fish'

d. Beebee Station and research on the ocean floor

III   Academic Writing

Organising the matter logically coherent, expressing appropriate writing functions, explaining the terminology and concept of reports, research papers, thesis, project proposals, letter writings, emphasizing on authenticity, using of source materials, documentation

Eg.

a. Technical Report about the scientific experiment upon the hydraulic vent - imagining to be one of the characters underneath the water doing research and writing a report to the authorities.

b. Project proposal for furthering the research activities- requisition for man power; equipments; funds; etc.

c. Letter writing

d. Exchange of letters between oceanic researchers to scientist on earth

e. Essay writing

1. A thematic study of the science fiction 'Star fish'

2. Establishment of research stations on and underneath the surface of the ocean

References

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[3] Munby, J. Communicative syllabus design: A sociolinguistic model for defining the content of purpose-specific language programmes. Cambridge: Cambridge University Press, 1978.

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[6] Robinson, P.C. ESP today: A practitioner's guide. New York: Prentice Hall International, 1991.