

ELT for Pharmaceutical Science Undergraduates: An Integration of Multidisciplinary Approaches

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ABSTRACT

English is a lingua franca of most of the countries of the world and having good language skills is a necessity in today's world of professional specialization. Girijananda Cowdhury Institute of Pharmaceutical Science of Assam is an Institute that provides Bachelor degree in Pharmaceutical science. As a technical discipline, Pharmaceutical science prefers its own specific language. Teachers of GIPS teach English Communication as a separate subject to develop the English language skills of the learners. As English can't be taught in isolation, it is not much of a help in developing language literacy. English language serves all disciplines and it is a prerequisite to have good language literacy especially in technical disciplines. Often teachers engage themselves in various approaches to develop language literacy of the learners. Keeping this in mind this study analyses the language needs of the Undergraduate learners of B.Pharma of GIPS, Guwahati, Assam.

I. Introduction

One of the important issues of today's education system is to develop proper understanding and expressivity of the learners in the subject of specialization. Various seminars and workshops are conducted to find appropriate approach to develop the literacy of the learners. A proper understanding on a subject area takes place when the learner has a good command over the language of instruction.

Pharmaceutical Science is one of the technical disciplines where proper knowledge of the language is necessary to understand the content and express it the way the discipline demands. There are many institutes in Guwahati, Assam that run undergraduate course in Pharmaceutical Science. The syllabus is prescribed by Pharmaceutical Council of India and the exams are conducted by Assam Science and Technology University. *Communication Skills* is one of the compulsory subjects introduced in the 1st semester. However, this subject is considered to

be a Non –University paper but the marks and the performance of the students in English Language is added in the End semester exams. They are expected to learn all the four language skills (LSRW) from the prescribed syllabus which mainly lay emphasis on theories of communication. The course content being theoretical is not much of a help. Although, the syllabus has some exercises that give some exposure to language learning to the students, it could not help learners as expected. It is also observed that after learning English language for a semester the students still lack in literacy in their concerned discipline. They try to avoid the technical usage of language. Hence, they cannot give the essence of the subject matter as students prefer to study from reference books written in diluted language. This practice of reading diluted language from reference books results in slow progress of development of literacy skills amongst students. This paper intends to discuss the specific language needs of the students of Bachelor of Pharmaceutical Science and use of

Multidisciplinary approach in English language class using two different subjects of B. Pharma course. Besides this, the researcher aims to discuss valuable insights given by the teachers and also analyzes the reflection of both the teachers and students after using Multidisciplinary approach in language classrooms with the following objectives:

1. To find the specific language needs of the undergraduate students of Pharmaceutical science.
2. To explain the concept of Multidisciplinary approach in a language class and its benefits.
3. To discuss opinions of teachers of concerned discipline and students of 1st semester on the application of Multidisciplinary approach in Language Class.

II. Literature review

The concept of Multidisciplinary approach is not so new but very few studies have been done to prove its effectiveness on improving language literacy. It has some similarities with CLIL approach. Wenshsien Yang (2016) in his study on *ESP vs. CLIL: A coin two sides or continuum of two extremes* made a good comparison between CLIL and ESP quoting that CLIL teachers have to spend more time on content teaching but pay a little less attention to language teaching. It shows a clear description of CLIL approach and the way it works. Although, CLIL and Multidisciplinary approach in Language teaching seem similar to a certain extent as these two approaches deal with content and language teaching, both the approaches are different in their own ways. This paper basically throws light on Multidisciplinary approach used in Undergraduate level as a strategy to develop disciplinary literacy in Pharmaceutical Science.

In Multidisciplinary approach different related subjects are brought together with language to develop literacy in technical subjects. *Multidisciplinary approach incorporates and connects key concepts and skills from many disciplines into the presentation of a single unit* Langa and Yost (2007:65.). Therefore, it is necessary to include different subjects for better understanding of concepts and developing language literacy of the undergraduate students. The following studies provide proof on merging Multidisciplinary approach in language learning.

Deborah Adenihun Adeyemi (2010) advocated the use of multidisciplinary approach in developing literacy of the students of Junior secondary schools in Botswana in the work *Justification of a Multidisciplinary Approach to Teaching Language in Botswana Junior Secondary Schools* (The Journal of Language, Technology and Entrepreneurship in Africa, 2010). Literacy is a fundamental asset of all learning area so it is important for a learners to comprehend the language complexity of any concerned discipline. Here the author justifies the use of Multidisciplinary approach in developing language literacy in secondary school context. The present study is similar in showing the effectiveness of using Multidisciplinary approach. However, the researcher throws light on applying the approach in Undergraduate level by including three subject area i.e. *Anatomy and Physiology, Pathology of Diseases and Language*.

Ishraga Bashir Mohammed Elhassan (2012) conducted a study for first year Undergraduate students in Sudan in integrating Multidisciplinary syllabus to teach English language. This programme was designed to develop all the LSRW skills including vocabulary and critical thinking skills. This foundation programme aimed

to bridge the gap between secondary school and University education. The findings revealed positive effect in language teaching. The study helped the researcher to analyse the critical thinking skills amongst students in language classroom of Undergraduate level.

Trien T Nguyen, Julia William, Angella Trimarchi (2015) conducted a study that aimed to find out students' perception on disciplinary approach in language teaching with traditional method of teaching. The study was based on the international students' requirements on content based learning and here the students were from Economics background and they had to undergo pre and post treatment assessment and exit interview in the end of the project. Discipline specific language teaching was found to be effective in both content and language learning.

From the above review it has been found that various studies have been done in the teaching learning process using Multidisciplinary approach in secondary and tertiary level. However, this study is purely based on the use of Multidisciplinary approach in Undergraduate level of Pharmaceutical Science.

III. Necessity of Needs Analysis

Waters and Hutchinson (1987) were of the opinion that a course cannot be a proper course if it ignores the needs of the learners. Language needs are such needs that help a learner to cope up with a course through proper use of language.

Finding the needs of the learners is very important to make a course content effective. It helps the educators and language practitioners to shape the curriculum development of a course according to the needs, wants and interests of the learners (Lepetit & Cichocki 2002). Therefore, it is necessary to find the actual language needs of the learners with the help of data collection. Language needs analysis will pave the way for the researcher to find the actual language needs and wants of the learners to develop the language literacy of the Pharmaceutical undergraduates.

The Study

Tools used:

To find the language needs of the learners of undergraduates it is important to collect data from the learners of Pharmaceutical Science, the researcher has used questionnaires, interviews and answer papers.

STEP 1: Here the factors affecting undergraduate level language literacy is measured by categorizing viz. strongly disagree, disagree, neutral, agree and strongly disagree from rank 1 to 5 respectively. The rank of the i^{th} category is represented by 'R_i'. Therefore, Response in categories is represented by 'R'. The number of respondent in the category is represented by 'n_i'

STEP 2: To compute the factors affecting literacy development, the following formula is considered. This formula is known as the weighted average method. In this method all the variables are multiplied by their weights, and then divided by the sum of weights.

(Weighted average: *It is a simple process of deriving an average value between two quantities when weight is added to it*)

$$\text{Weighted average (W.A.)} = \frac{n_1 R_1 + n_2 R_2 + n_3 R_3 + n_4 R_4 + n_5 R_5 + n_6 R_6}{n_1 + n_2 + n_3 + n_4 + n_5 + n_6}$$

$$\frac{\sum_{i=1}^5 n_i R_i}{N} \quad \frac{\sum_{i=1}^5 n_i R_i}{N} \quad N = \sum n_i \quad i = 1, 2, 3, 4, 5$$

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The following table shows the weighted average factors affecting learners' language literacy.

1.1 WEIGHTED AVERAGE OF FACTORS AFFECTING LEARNERS' LANGUAGE LITERACY

Statement	Strongly disagree (1)	disagree (2)	Neutral (3)	Agree (4)	Strongly agree	Weighted average
I face problem in understanding technical language used in text books.	3	5	6	16	0	2.4
I often face difficulty interacting with teachers in English	2	6	10	10	2	3.1
I take help of reference books for better understanding	3	5	5	5	12	3.6
I commit grammatical errors in writing answers, paragraphs	4	6	7	10	3	2.8
Whenever I paraphrase ,I get bogged down to original content in textbooks.	6	3	3	14	4	3.2
I find it challenging to express a particular subject matter of my discipline using appropriate language both in speaking and writing	3	5	5	5	12	3.6

Table :1

Interpretation:

From the table shown above on analysis of language needs with the factors affecting language literacy, it is found that in two categories 3.6 is scored in weighted average column i.e. the learners face difficulty in comprehending the technical language used in their own discipline. The two most important factors for their lack of

language literacy are, they use reference books for diluted language and learners find it challenging to express a particular subject matter in their own discipline with appropriate technical language.

Data analysis based on the other questions:

Do you think the present subject on Communication skills helps you to comprehend the language used in your text books? Explain why do you think so.

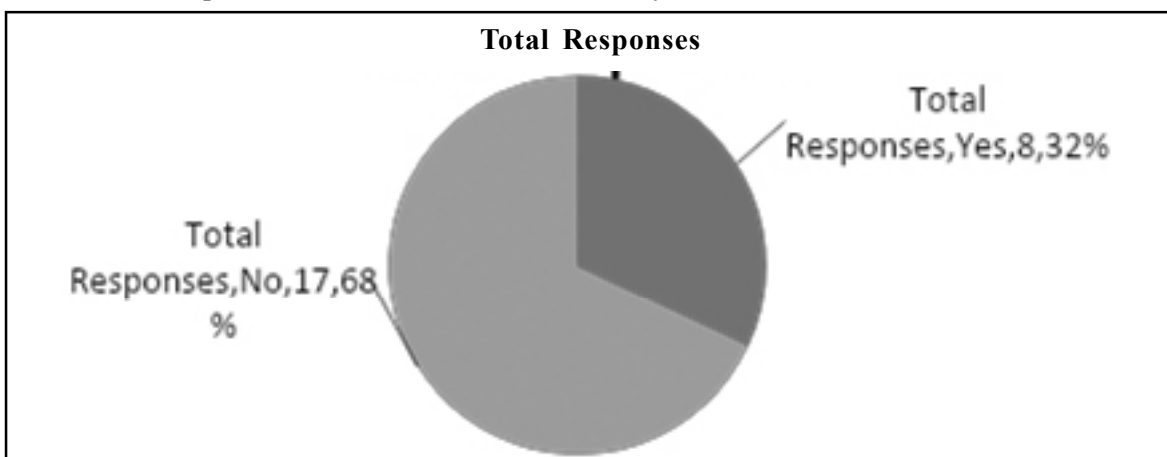


Fig. 1: Percentage of responses of learners to Q. No. 1

In the above diagram, almost 68% learners said that the present subject on Communication Skill didn't help them much in comprehending their own subjects.

2. Do you think it will be beneficial for you to learn English using your own subject?

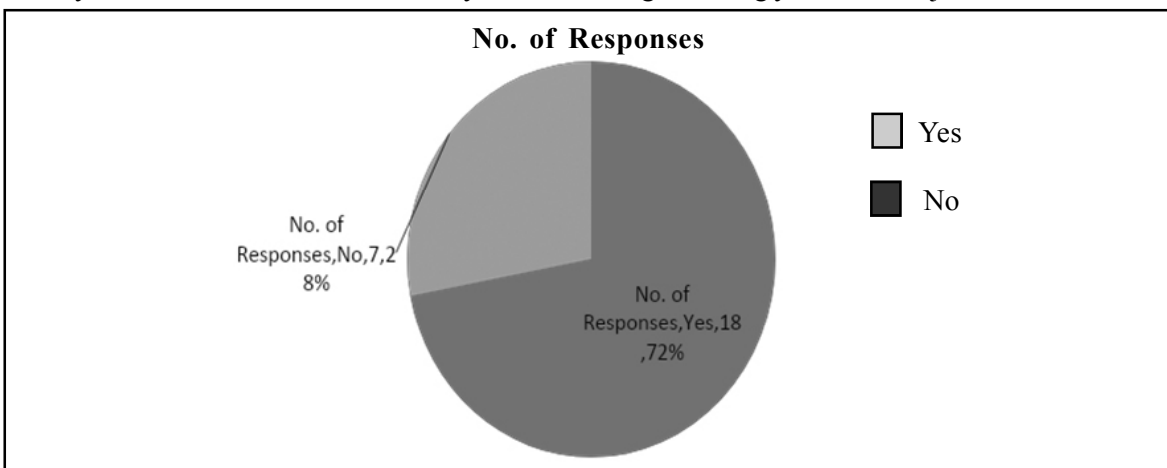


Fig. 2: Percentage of responses of learners to Q. No. 2

In the above diagram it is seen that 72% learners said that it sounded interesting to them. Although they had little idea on this teaching methodology, they showed interest in learning.

IV. Findings

Based on the interviews and data collected, the researcher has found some general and specific language needs of the learners. Some of the general and specific needs mentioned below are purely based on the discussion with learners and teachers.

Some of the general language needs of the Undergraduate students of Pharmaceutical Science

Needs of a learner in language education is the gap between the learners current competence and the outcomes that are expected to be achieved by the learner. (Richard,2001). Every discipline has its own language demands. Therefore, it is also expected from a learner of that particular discipline to behave and use language the way it has been used.

In this study the researcher analyses the needs of the Pharmaceutical students of undergraduate level in Guwahati. As most of the content taught in Pharmaceuticals are related to Medicine, Biology, Zoology and Chemistry the structure of

Language will have similarities. The needs analysis is done after a data collection which is based on eliciting feedback from students and fellow teachers of Pharmaceuticals through questionnaire, interviews and tasks given to students. The syllabus prescribed for B. Pharmacy is same for all Universities in India.

Considering the expected outcomes of the language competence of a learner the general needs are basically writing Lab reports effectively, use of specific technical vocabularies and language structures, speaking in front of a gathering or subject specific experts in presentations, comprehending complex language structures of Medical science, knowledge of appropriate vocabulary. However, as English is not a core subject of Pharmaceuticals students find it uninteresting.

Some of the specific English language needs of the Undergraduate students of Pharmaceutical Science

After graduation the students will be able to apply for jobs in the Industry, Marketing and as Pharmacists. After discussing with subject experts of Pharmaceutical Science, it has been observed that these fields have specific language needs such as in different sectors different language skills play an important role.

S1.No.	Field of Work / Situations	Language Skills	Specific needs
1	Marketing(Medical Representative)	LSRW	Specific Medical Vocabulary, Comprehension of technical text
2.	Sales(Pharmacist)	LSRW	Knowledge of chemical compositions in medicine, use of subsills of language depending on situations
3.	Academicians/ Research Scholars	LSRW	Comprehension of text, Critical thinking, Expression of thoughts in research, Proper stock of technical vocabulary
4	As students (preparing for writing answers or articles)	i. LSRW	Proper language structure, Ability to comprehend a technical text, Critical thinking skills
5	Students and Researchers	LSRW	Grammatical structures, sentence constructions , Vocabulary, Critical thinking skills

Table: 2 (specific needs)

After analyzing the specific language needs of the B.Pharma students it has been observed that some changes in the teaching approach can meet certain language needs of the undergraduate students. As the Communication Skill subject is a Non-University paper there is an opportunity to modify tasks by using an integrated approach. As students are not benefited with the general paper on Communication Skills, integration of different subjects may help in improving their comprehension skills and critical thinking skills.

Hence, changing the general approach of teaching through Multidisciplinary approach may be beneficial to the students as it is an approach where concept can be taught by integrating different subjects together for better understanding.

V. The Study

What is Multidisciplinary Approach?

Multidisciplinary approach for developing the language literacy of the learners came into the field of Education and other fields, around 1920s and it has gained popularity in the United States as an alternate way of teaching.

In Multidisciplinary approach, the discussed area of learning is kept untouched by uniting other related disciplines by organizing the curriculum around concepts, questions, themes or problems. Language acquisition cannot take place in isolation or it cannot be learned separately from meaning. Learning a language always needs a context to gain knowledge. Therefore, the involvement of more than two disciplines makes learning literacy more effective and interesting. As natural language acquisition process always takes place in context with different situations of real life, similarly language literacy can be easily acquired if other related subjects are conjoined and united

for better understanding. To illustrate Multidisciplinary approach, a diagram is given below

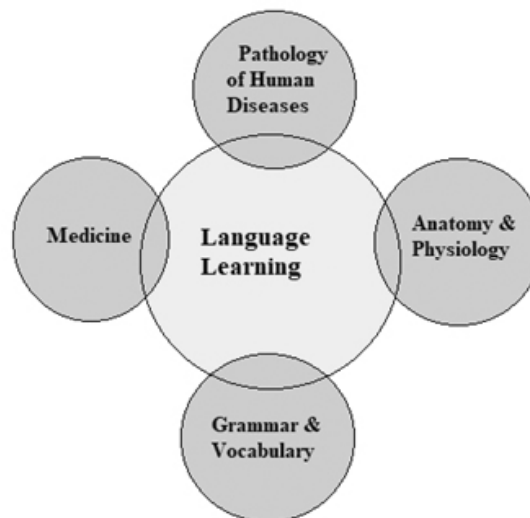


Fig. 3

Source: Adapted from *Meeting Standards through Integrated Curriculum* by Susan M. Drake and Rebecca C. Burns

(Fig:3) represents how language learning can take place by including different subjects .

Methodology used to apply Multidisciplinary Approach in Language classroom

The language used in Pharmaceutical science is the language of Medicine and Science where students need proper language literacy skills as mentioned earlier. As the language used is very technical, students find difficulty in understanding the context from books. They prefer reference books written in diluted language for better understanding. This is followed by further simplification of language by using easy synonyms and structures when they present or write in the exam and they end up using bad English which becomes teachers' major concern.

To analyze the consequence of the application of multidisciplinary approach in language classroom, two related subjects from pharmaceutical science were taken and integrated in the language class. Subject 1 & 2: *Pathology of human diseases* and *Anatomy and Physiology*. As these two subjects are closely related with each other these two subjects were taken as text for the Language class. This was an initial step taken by assigning the

students of 1st semester a multidisciplinary approach task to analyze how effective the approach will be for further use.

Case Study:

The approach was applied with 1st semester students of Pharmaceutical Science of Girijananda Chowdhury Institute of Pharmaceutical Science (GIPS).

Steps associated with the study

Steps	Activity	Learners' Role	Rationale	Language skills
1.	Two passages (Passage A and Passage B) from two different books on <i>Physiology of Human Diseases</i> written in simple language and other book written in a complex language with the use of technical language given to students.	Read and understand		Reading
2	Introductory text to read and answer questions based on scanning.	Answer	Scanning	Reading
3	Taking help of a subject expert in <i>Pathology</i> , the students were given a brief explanation on technical concepts of 'Portal vein hypertension and its mechanism'.		This activity is to develop comprehension.	Vocabulary, Reading
4	Assigned multiple choice questions on some of the concepts of Portal Hypertension	Answer	Helps in skimming and Critical thinking	Reading
5	The students were asked different questions on the passage given to them on Portal Hypertension.	Discuss and answer on their own understanding.	Critical thinking	
6	They were then asked to write about the context on their own using technical use of language.		to expose them largely to the language of Medicine and the concept of the disease. This activity was helpful to bring them into practice of scientific writing.	Writing

Table 3:

50% of the students answered the questions in simple language avoiding technical usage of language. 40% tried to copy the language from the original text given to them. 10% students tried to answer the questions following the proper structure and technical language as demanded by the subject. The grammatical errors found in their answers were corrected in the open feedback session.

This task was designed involving two teachers from Pharmaceutical Science dealing with the Papers *Anatomy and Physiology* and *Pathology of Human Diseases*. This task was done to develop the language literacy of the students in the field of Medicine. The aim of Multidisciplinary approach is to teach the concepts from more than two subjects or area of learning. In this way students or learners learnt concepts in connection with related discipline and learning became easy and fruitful.

VI. Discussion

Cumulative feedback of the Subject Teachers

When the approach was first explained to the subject teachers, they were confused. However, the doubts got clarified after designing the tasks. After participating in the process, they realized the tasks designed with the use of Multidisciplinary approach were effective and worked successfully. They said that the learners participated actively in the class and learned most of the technical terms while doing the exercises. This activity was new to them and some of them said that this kind of activity may be time consuming. According to the subject teachers the multidisciplinary approach will be fruitful if a language teacher does not have time constraint to complete the English language course. Apart from this, by integrating two or more related

subjects to teach a key subject helps in overall development of the course.

Cumulative feedback of students

According to the students, they were at first scared when they were given the passages from *Pathology* as the concept of 'Portal Hypertension' was new to them. However, providing them with the guided tasks helped them to understand the concepts and the multiple choice questions were very effective.

Other than this, as the students were not aware of the structure of language expected to write in scientific scripts, the task helped them to form and understand the concept science writing. In addition to that they opined that through this approach they unknowingly learned language while understanding the concept of 'Portal vein Hypertension'.

Analysis : on the case study conducted in the previous section

After discussions with the teachers and students about the task, it was found that the teachers of the two subjects found the approach very meaningful and useful for development of language competence of the students. As English language serves all disciplines, it is equally important for teachers of other disciplines to take the responsibility of developing students' literacy. It is due to the lack of global literacy amongst students that stops them in understanding and delivering information in technical language.

In addition to that, Multidisciplinary approach not only develops the literacy skills and critical thinking skills, it simultaneously develops interest amongst learners to learn language and content together. Moreover, the repeated use of technical words and specific sentence structures used in the activities helped them to remember the words for future use in technical contexts.

This is an observation made in one class of 2 hours. The students' performance both in writing and speaking would thus be enhanced.

VII. Conclusion

Multidisciplinary approach plays a vital role in the present global scenario as the world is a mixture of diverse entity and can be understood with integration. As language learning cannot take place in isolation, it is important to bring different concepts together for better learning. Multidisciplinary instruction enables learners to think critically (Davis, 1997). Therefore, it helps learners to learn concepts in a less challenging way. It involves complex concepts as well as teachers from other disciplines which allow students to gain knowledge and skills from multiple areas of learning. With the help of Multidisciplinary approach students will be able to see the connection with different subject matters and transfer knowledge efficiently as expected in different disciplines.

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