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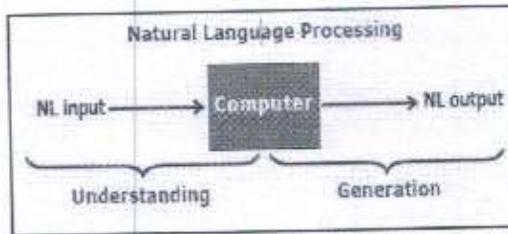
Fig.1.Natural Language Processing

In Fig.1, Natural Language Understanding (NLU) takes input in natural language given by the user, understands it and also reasons it. On the other side, we have Natural Language Generation (NLG), which is a natural language processing task concerned with computer programs to produce output in natural language from the machine representation system.

The objective of a Natural Language Understanding is to interpret an input text fragment. The process of interpretation is often viewed as a translation of the text from a natural language to a representation in an unambiguous formal language. This representation is further used for performing concrete tasks to respond to the user's request. To understand and process natural language query, the system should have linguistic knowledge. Morphological analysis, syntactic analysis, semantic analysis, pragmatics analysis, shallow parser etc. are various tools and techniques available. Every researcher used its own algorithm, technique, model and architecture for query processing. Natural language understanding has four phases [2] or stages. These phases are shown in Fig.2. These all phases are discussed below:
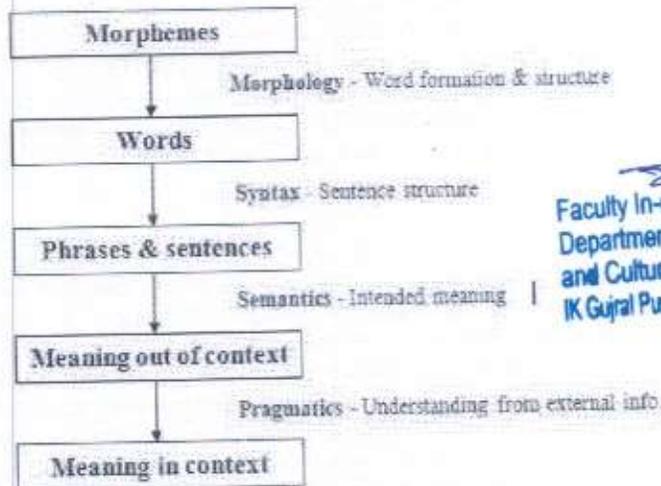

Fig.2.Phases of Natural Language Understanding

Morphology is the initial stage of analysis once input has been received. It looks at the ways in which words break down into their components and how that affects their grammatical status. Morphology is generally useful for identifying the parts of speech in a sentence and words that interact together. Morphology is identification, analysis and description of structure of words.

Syntax involves applying the laws of the target language's grammar. Its task is to determine the role of every word in a sentence and manage this data into a structure that is more easily manipulated for further analysis.

Semantics determines possible meanings of words and sentence in a context. After determining the structure of a sentence the next step is to determine the meaning of the words and sentence.

Pragmatics is the order of steps that exposes the overall purpose of the statement being analyzed. This will be broken down into Ambiguity and Disambiguation to facilitate understanding.

3   Literature Survey

Only in little span of years, there is drastic increase in the field of NLP, because of the need of the user to search the precise information from the web. So, Simmons (1965) [3] introduced the survey article " Answering English Questions-

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7   Conclusion

The Question Answering basedDialogue System will assists the usersspecially, the rural areas of Punjab who are not comfortable in communication in English.The system helps them to get information without searching on internet. It is first time any dialogue system is to be developed for Punjabi language. It will also help to develop dialogue system in other Indian languages. The system starts with detailed analysis of input query with the help of tokenizing. Then the keywords found help us to select appropriate SQL Query frame. SQL Query is generated with the help of these Query frames. At last system give answer to user in Punjabi language text. A good question answering dialogue system is one which allows user to interact with the system with fewer problems. There are problemswhich evolved while developing the text-based question answering dialogue question answering system because the understanding of natural language is very difficult task for the computer systems.

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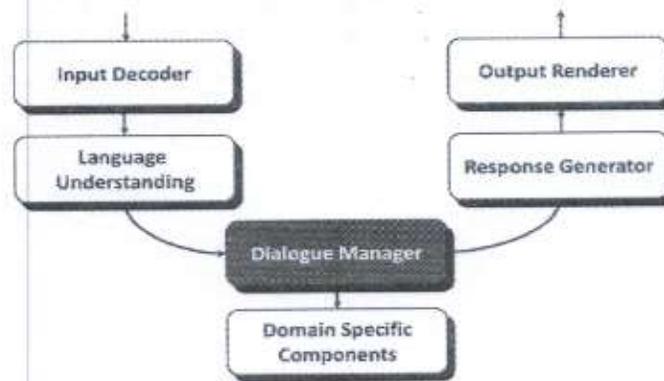
Fig.1 - Components of dialogue system

3.1 Input Decoder

Input Decoder component is the one which recognizes the input. It converts the input to the simple text. This component is present only in which are not text base dialogue systems. This component involves conversion of spoken sound (user utterances) to text (a string of words). This requires the knowledge of phonetics and phonology. Phonetics is branch of linguistic which deals with the sound of speech and their production, combination, description and representation by written symbols. Phonology is study of speech sound in language or a language with reference to their distribution and patterning and to tacit rules governing pronunciation. For this purpose speech Recognition is needed. There are many systems available for this purpose. These are called Automatic Speech Recognition (ASR), Computer Speech Recognition or simply Speech to Text (STT). Besides speech the dialogue system can have other inputs like gesture, handwriting etc.

3.2 Natural Language Understanding

As the name suggest this unit try to understand what user want to tell. It converts the sequence of words into a semantic representation that can be used by the dialogue manager. This component involves use of morphology, syntax and semantics. Morphology is the study of the structure and content of word forms. After identifying the keywords and forming a meaning it provide it to dialogue manager.

3.3 Dialogue Manager

The Dialogue Manager manages all aspects of the dialogue. It takes a semantic representation of the user's text, figures out how text fits in the overall context and creates a semantic representation of the system response. It performs many tasks these are:

- Maintains the history of dialogue
- Adopts certain dialogue strategies
- Deal with malformed and unrecognized text
- Retrieve the contents stored in files or database
- Decides the best response for user
- Manage initiative and system response
- Handle issue of pragmatics
- Discourse analysis
- It also performs grounding
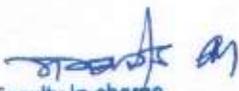
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- For these tasks dialogue manager has many components these components are:
- Dialogue Model
- User Model
- Knowledge Base
- Discourse Manager
- Reference Resolver
- Grounding Module
-

System: What is your destination?
User: Amritsar
System: Do you want to travel to Amritsar?
User: Yes
System: What day do you want to travel?
User: 31-12-2012
System: Do you want to travel on 31-12-2012?
User: Yes
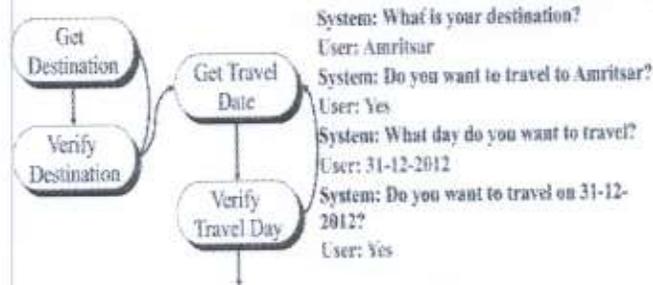
Fig. 2 – Example of Finite State based System

4.1.1 Advantages
- Simple to construct
- The required vocabulary and grammar for each state can be determined in advance.

4.1.2 Disadvantages
- Dialogues are not natural
- Do not allow over-informative answers
- Inhabits the user ability to ask questions and take initiative.

4.2 Frame Based Systems

Frame Based systems uses template filling from user response. In this system user is asked questions that enable the system to fill slots in a template in order to perform tasks. The flow of dialogue is not predetermined but depends upon the content of user input and the information the user has to elicit. Example is shown in Fig.3, in which we can see there are two different dialogues in first the dialogue goes like finite state system. In second dialogue user provide over information in respond to a question but system fills its slots of from the user's input and asks for the remaining information. This is how frame based systems works.


Destination City: Amritsar
Departure Day: Monday
Departure Date: December 31
Departure Time: 09 am

System: What is your destination?
User: Amritsar
System: What day do you want to travel?
User: Monday

System: What is your destination?
User: Amritsar on Monday, December 10 around 9 in the morning.
System: I have the following connection...
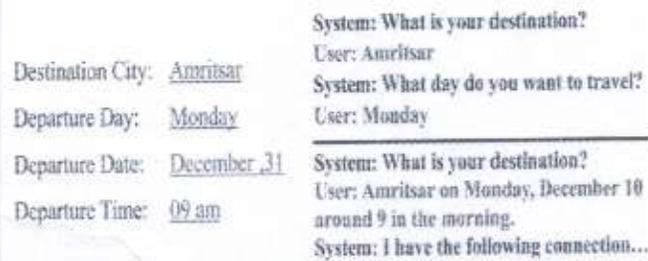
Fig. 3 – Example of Frame Based System

4.2.1 Advantages
- Allow more natural Dialogues
- User can provide over informative answers

4.2.2 Disadvantages
- These systems can't handle complex dialogues
- Range of application is limited to the systems that elicit information from users and act on the basis on the same

4.3 Agent Based Systems

These systems allow complex communication between the system, the user and

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the application in order to solve some problem or task. The interaction is viewed as interaction between two agents, each of which is capable of reasoning about its own actions and beliefs. The dialogue model takes the preceding context into account. The dialogue evolves dynamically as a sequence of related steps that build on top of each other.

4.3.1 Advantages
- Allow natural language in complex domain
- User friendly, like talking to human

4.3.2 Disadvantages
- These systems are hard to build
- The agent itself are usually very complex

5. Challenges

To build dialogue system developers faces many difficulties. These are due lack of computer's understanding of natural language. This problem arises many challenges for developers e.g. problem of Anaphora Resolution, Inferences, Ellipsis, Pragmatics, Reference resolutions and Clarifications, Inter sentential Ellipsis etc.[7] Besides these language problem other challenges is to design system prompts, grounding, detection of conflicts and plan recognition etc. In the spoken dialogue systems the problem related to utterance of the user occur like ill formed utterances. These are the some of the challenges that developers have to take care of at designing time.

6. Dialogue System Evaluation

An optimal dialogue system is one which allows a user to accomplish their goals with the fewest problems. It includes evaluating the correctness of the total solution e.g. percentage of slots that were filled with the correct values. Then measures of the system's efficiency at helping users
e.g. check the total elapsed time for the dialogue. In the last user's perception of the system e.g. number of times the ASR system failed to return any sentence or rejected prompts ("I'm sorry I didn't understand that"). Or the number of times the user had to barge-in (interrupt the system). We can also do user satisfaction survey. In the survey we can ask performance of ASR, TTS from user. We can take ratings for task ease, system response, interaction speed, user expertise and system behavior etc. For this survey following are some questions that can be used.

TTS Performance	Was the system easy to understand ?
ASR Performance	Did the system understand what you said?
Task Ease	Was it easy to find the message/flight/train you wanted?
Interaction Pace	Was the pace of interaction with the system appropriate?
User Expertise	Did you know what you could say at each point?
System Response	How often was the system sluggish and slow to reply to you?
Expected Behavior	Did the system work the way you expected it to?
Future Use	Do you think you'd use the system in the future?

**Fig. 4 – User Satisfaction Survey**[7]
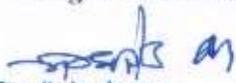
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7. Conclusion

In the conclusion we can say that a Dialogue system is very good tool for interaction between any application and user. This is good tool and can be used in many devices such as mobiles, telephones, computers etc. It can be a good tool for web site assistance which can have domain of online shopping, travelling information, counseling, tutoring system, ticket booking, Remote banking, Travel reservation, Information enquiry, Stock transactions, Taxi bookings, Route planning etc.

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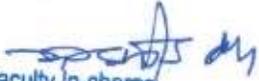
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EMERGING NEED TO RETHINK ENGLISH LANGUAGE PEDAGOGIES IN INDIAN TECHNICAL EDUCATION: CREATIVE PEDAGOGY A BETTER APPROACH FOR VOCABULARY INSTRUCTION

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Abstract

Purpose of the study: The present paper underlines the emerging need for English teachers to customize or introduce productive changes in prevailing pedagogies of vocabulary instruction in engineering classrooms. It places the creative teaching pedagogy as a better solution and lays impetus on the teacher's innovation in preparing resources to help students organize lexical items into apposite contexts while writing and speaking.

Methodology: The paper identifies some of the creative methods of vocabulary instruction. This identification is based on the experiments conducted to facilitate the vocabulary instruction to the engineering students at the main campus of IKG Punjab Technical University, Kapurthala. These procedures are of ample significance for the students pursuing engineering or technical education.

Main Findings: The outcome of experiments and interactions with students emphasizes the wide range of current and contextual significance of creative pedagogy for teaching vocabulary to engineering students. The significance of a teacher's creativity and his/her active participation in vocabulary instruction is accentuated. The problem of the creation of resources that would train students to build up their language ability is also dealt with.

Application of this study: As the paper addresses the issue of building up the language ability of students of technical education to improve their employability, its applicability is extended beyond the disciplines of English Language teaching and technical education. This study and its utility can very well be customized and extended to different disciplines as well.

Originality/Novelty of this study: The usefulness of creative teaching pedagogy has not been fully realized because of the teachers' reluctance to think inventively. The present study is new in the sense that it will enable teachers to adapt to creative teaching pedagogy, identify appropriate creative pedagogical techniques and innovatively adjust their teaching practices to suit diverse classes.

Keywords: *Indian Technical Education, Creative Pedagogy, Vocabulary Instruction, ESL, LPG.*

INTRODUCTION

English language teaching was launched in India almost at the same time when it was started to be taught in England. Since then, it has by no means stayed back in bringing in and implementing the teaching-learning theories developed. Over two centuries after time, we have produced considerably a large number of English- literate people yet the proposition in the favor or opposition to the introduction and teaching of English as a second language (ESL) is rampant. It is facing a grim challenge especially when it comes to the global employability of the students pursuing technical education. With the LPG (Liberalization, Privatization, and Globalization) revolution, the number of technical universities/institutes across the country has drastically gone up. Most students pursue their studies in these institutions for getting placements through campus interviews. Further, in interviews, employers also seek only those contenders who are adept in both verbal communication and soft skills. They look ahead to the parent institutes to chisel these skills of students so that they could concentrate more on the technical aspects of the job profile during instruction they provide soon after the employment. Thus, the education of English as a global means of communication has become pertinent and momentous especially in technical education because such training improves the global employability of the students.

Emerging Need to Rethink English Language Pedagogies

Today, with a large number of students hailing from a myriad of exposures, the teaching profession is increasingly becoming a challenge in our country. Frand(2000) in his article "The Information Age Mindset: Changes in Students and Implications for Higher Education" states that the ethos of young learners today is completely diverse from that of their predecessors "who were only exposed to analog technologies like broadcast radio, television, and print-based texts" (p. 16). He further emphasizes that today, information technology is not considered to be technical know-how but an indispensable and natural part of life. The computer and internet are considered better than TV as these ensure effective communication and multitasking. "A ubiquitous digital environment surrounding today's learners make them think and process information differently from their predecessors" (p. 16). Sometimes, many concerted efforts to nurture and keep the learning going among students seem a major challenge to teachers.

And it is even a bigger challenge in the case of English language instruction which has always been a topic of debate in the Indian ESL context. Largely, there have been two sections of academicians and researchers endlessly engaging in deliberations over English language teaching in India. The first section supports the teaching of literature for its own sake

and cultural development while the other faction of scholars promotes an approach that is more language-oriented and uses literature as an essential resource to teach a language. The interesting thing in the Indian ESL context is that this divergence of thoughts does not appear to have influenced a large number of students because their curriculum and whatever is being taught to them is important. The result is that the majority of students' study ESL for more than 10 years. Neither they become linguistically competent nor do they get cultural enrichment. Rather they gain awareness about their rights, the political systems, the social structures, and religious practices through disciplines like Sociology, History and Political Science. Despite university degrees in their hands, the majority of students are unemployable. Bernabas (2017) mentions that one of the major influences of globalization is the career prospects it has brought for graduates in the IT-BPO sector. It is due to these job openings available in the service industry, several countries around the world insist that "their school leavers' proficiency in English should be gradable at B1 on the Common European Frame of Reference" (p. 4). Graddol (2010) believes that attaining this in the Indian context is a tedious task because essential school level learning gets finished by the age of 14 or 15. The students do not get enough knowledge and competency in English to take up good jobs even after so many years of study in schools and colleges. The reason is that the English language is being taught as a subject but not as a skill both in elementary and higher classes. It hardly enables the students to communicate effectively though it makes them capable enough to pass the written examination. Instead of providing the real communicative environment to the students where they can have practical conversation activities/session, they are bombarded with complex grammatical rules which make the English language learning a burdensome and uninteresting process. Therefore, there is a scarcity of skilled professionals in India. To meet the requirement of a skilled workforce, the education system needs to be upgraded in a way that would prepare the students for technical jobs or a large gamut of jobs. Serious adaptations in the teaching pedagogies of English are the need of the hour. It does not mean that the English teacher is expected to device any magic wand to make their students effective speakers in a short period rather they are to adopt effective and applicative ways of imparting English language skills. Even, teachers find it very difficult to provide customized syllabi and pedagogy. Fortunately, today we have technical support at our service that "allows a quantum leap in the delivery of individualized services for both students and teachers...that addresses the different bits of intelligence (and) that allows students to exhibit their understandings in diverse symbols systems ...". (Prensky, 2001, p. 179)

Existing Methods of Language Teaching

Before moving ahead with our discussion, it becomes necessary to have an idea about different language teaching methods followed in our country to date. It also poses a significant question have we ever been diffident to take on innovative teaching methods in India? Scholarly researches in the field of language teaching have provided us many teaching methods from time to time. And most of the teaching methodologies and techniques we have adopted in our country have had colonial roots. Well known as a traditional teaching technique, the Grammar-Translation method was followed earlier wherein importance was given to the teaching of language forms, paraphrasing/translation of texts and memorization of the vocabulary. Chomsky(1968) in developing his 'Theory of Linguistic Competence and Performance' followed this method wherein he explains that linguistic competence has to do with 'knowing' a language and performance is concerned with 'doing' with language. Chomsky's theory faced a lot of resistance from Dell Hymes' theory of 'Communicative Competence' in 1966. According to Hymes, language being a tool of communication is socially determined and an appropriate method of teaching should focus more on its varied functions. CLT (Communicative Language Competence) plays an active role in language teaching as it covers the aspect of ethnography. Moreover, in India, the significance given to the spoken English and emergence of so many institutes offering training for the same is an evidence of the fact that learning functions of a language are more important than learning its forms.

Since 1987, N.S. Prabhu's Task-Based Language Teaching has established its place as an effective language teaching pedagogy especially at the school level. TBLT wherein students are given certain tasks based upon real-life situations and project-based assignments following the given set of instructions. These real-life situations could include visiting a bank, visiting a library, making a phone call, conducting an interview, etc. The impetus is not on the complete accuracy of grammar and vocabulary rather enables the students to coin creative language strategy to complete the given task or assignment within what they already know of the given language. The objective is to develop creativity and spontaneity in the use of a language, both spoken and written. Prabhu's threefold concept of information gap, reasoning gap, and opinion gap affected a positive change in prevailing language teaching pedagogies.

No one can deny the contribution made by CLT and TBLT in bringing thoughtful consideration and responsiveness towards second language acquisition in India but the present employability level of the young professionals reinforces the emerging need to device such pedagogical language learning model which is more of experiment/activity-oriented and which suits to the varying needs of heterogeneous group of learners.

LITERATURE REVIEW

Krashen (2019) states that the direct method of teaching vocabulary is more beneficial if taught through the skill-building approach. It ensures fast proficiency. The method includes "pre-teaching vocabulary before a story or reading a text, interrupting the reading or listening with vocabulary lessons, and post-story vocabulary instruction" (pp. 9-13).

The article "Reinventing the Mode of Teaching: Question as a way of Getting" (Agarwal, 2017) emphasizes that in today's competitive world when the teaching has taken the shape of mentoring, the learners must be positioned at the

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center and their capability be utilized to the full. A learning approach that makes the students actively involved is the need of the hour. Incorporating questioning as a technique of effective teaching-learning in the classroom is also suggested in the paper.

Lin (2011) states that creative pedagogy fosters curiosity among learners. There is a need to bring in variety in the models of instruction from an early level education to a high-level classroom teaching. Lin also emphasizes on creating an appropriate learning environment to enable creative learning and expression because classroom activities would require a suitable learning background.

Hackbert (2010) rightly states that flexibility and innovation are the key factors in creative pedagogy. Though there are various models of classroom teaching yet there is an emerging need to bring in variations based on class/grade and even group of students.

Mukherjee (2009) lays impetus on the requirement of innovative pedagogical practices to improve the present employability level of young professionals. In his opinion, teaching methodology and approaches adopted in our country from time to time have had colonial origins. In a few places, insignificant changes have taken place in the syllabus and teaching of undergraduate English.

Sawyer (2006)in his article "Educating for Innovation" emphasizes that the responsibility of creating innovative teaching resources rests with the teacher. "Every class and its students pose a unique challenge to the teachers and hence it becomes the responsibility of the teachers to think creatively to build and nurture the learning environment" (pp. 41-48).

Brown(2000) in his book *Principle of Language Learning and Teaching* opines that language learning for sure needs motivation, Particularly in ESL, proper motivation is the only strength that enables a teacher to declare that his/her students will be doing well.

In their article "The Authors Respond", McQuillan &Tse(1999) conclude that learners can understand the inputs provided to them even without isolated vocabulary teaching, using techniques like visuals, signs, and modulation. In their view, most vocabulary acquisition is additional and incremental. "Students pick up new words while focusing on a meaningful activity, getting a bit more of the meaning each time they encounter the words in context" (p. 6).

The article "Vocabulary acquisition from listening to stories and explanations of target words" establishes the fact that the students who listened to two stories and were provided a short clarification of the underlined words "learned significantly more new words and retained information better six weeks later than students who heard stories with no explanation of the marked words"(Brett, Rothlein& Hurley, 1996. pp. 415-422).

Twadell(1973) brings out the idea of 'gradual acquisition of vocabulary' when he states that "we may 'know' a very large number of words with various degrees of vagueness... in a twilight zone between the darkness of unfamiliarity and the brightness of complete familiarity" (pp. 61-78).

THE RATIONALE OF THE STUDY

Engineering students are quite conscious of the need to develop their lexis as well as boost their communication proficiency. To assist them, different approaches and techniques have been practiced and organized for use over the years. Though new teaching pedagogies are coming up yet the vast majority of the teachers use traditional methods of teaching vocabulary wherein a teacher mainly gives attention to the translation of technical terms/texts. Students are not inspired to interact and discuss. But now the time has come for the shift in focus from the conventional models of teaching to the creative teaching pedagogy which makes use of both task-based approach and communicative approach.

At IKGPTU, the basic idea behind language lab courses is to give the engineering students a realistic, hands-on preparation and experience on English language skills so that towards the end of the course, they would be able to generate enough confidence, give formal presentations, face an audience and handle placement interviews, hence while designing each task, the teachers have to be very careful that they do not make the lab sessions forming for the students or else it may be very difficult for such students to concentrate effectively for two or more hours on something which is not directly related to their core field of study.

The present study is an attempt to place creative teaching pedagogy as a better solution to train engineering students in vocabulary and communication skills. It is just another method being implemented by the teachers these days to increase the vigorous partaking of students in the process of learning. The salient features of creative pedagogy are:

1. It is the reworking of the existing teaching practices. The task/activity given in this method is not new rather it involves being able to teach creatively.

2. This pedagogy focuses on the teacher's ability and innovation in shifting perspectives in existing methods and preparing something different for the class. Originality is exceedingly required in creative teaching pedagogy.

3. It emphasizes that the teachers should tailor-make the instructional models to suit the varying needs of the heterogeneous learner groups they meet with.

4. All the instructional models are based on classroom practices /experiments.

5. The commitment from both the teachers and students, here would be high.

The paper identifies the need to customize the vocabulary instructions and some of its appropriate methods that are of ample significance for engineering/technical students. Almost all these methods are based on experiments conducted to facilitate the vocabulary instruction to the engineering students of the main campus of IKG Punjab Technical University, Punjab. The paper also lays impetus on the teacher's innovations in preparing materials to help learners organize lexical items into suitable contexts while writing and speaking.

Aggarwal (2017) rightly understands the dilemma of the present times when she puts forward a few questions which generally crop up in the mind. These questions are: Are our teachers innovative enough to train the coming generations? Are teachers intelligent enough to inspire the students to think out of the box? "In the problem lies the solution. Only what we need to do is to just let go off the existing norms and make way for something new" (p. 11).

OBJECTIVES OF THE STUDY

Precisely, the present study shall have the following objectives:

1. To understand the various barriers that students face in building their vocabulary through the traditional model of learning.

2. To identify appropriate creative teaching practices to build vocabulary among learners.

3. To mention some classroom practices/experiments on creative teaching pedagogy, conducted in classroom contexts to facilitate teachers to creatively modify and develop tasks/activities to suit the heterogeneous group of students.

Technical knowledge is the core of their study, the engineering students are expected to have clarity of thought, language proficiency and clear expression in speaking and writing which in turn requires more productive vocabulary. The same is endorsed by Richards & Renandya (2002) when they state thus "vocabulary is a primary component of language proficiency and give much of the basis for how well learners speak, listen, read and write" (p. 255).

In the present-day situation, most of the students in engineering colleges/institutes are ESL. They spend most of the time using their mother tongue and find it very hard to access a technical thought in the target language. The reason is that they lack the vocabulary of that target language. Srilakshmi & Kiranmai (2017) in "Teaching a Vocabulary: Task-based Approach" reinforces the importance of vocabulary by quoting Leki& Carson (1994) who states that "it was found that students taking university courses identified vocabulary as a major hindrance in academic writing tasks" (p. 37). Skehan's (1998) opines that it is possible to communicate at least something without grammar but without vocabulary, nothing can be communicated.

Most English teachers find vocabulary teaching to be a challenging process. One plain reason is that the traditional way of teaching vocabulary wherein students are made to memorize a list of words and their meanings do not yield effective results. Moreover, vocabulary taught in isolation may not help the learners continue it for long time use. Quite often, when it is executed in the classrooms where students are not provided detailed study material or book, a gap exists. The students may become familiar with the definition of a word but may not learn its logical relationship with other words and its functions in different contexts. Stahl (2005) in *Teaching Word Meanings* rightly states that vocabulary knowledge is real knowledge. Knowing a word does not only require the learning of a definition rather suggests how that word can be used in different contexts. So, the learning of vocabulary mainly rests on involving the students in various activities that enable them to comprehend the meanings of words and make realistic and purposeful communication. The curricula of almost all the undergraduate courses include a compulsory English language & literature or a specific English language subject. The following are some of the few methods which can be practiced:

A. Grouping words

Grouping words is a widespread method of teaching vocabulary but usually unobserved in traditional classroom settings. Grouping of the lexis includes grouping words of the comparable set, related in meaning or context. If students are directed to cluster and label the words, the familiarity with them increases and they become able to use them appropriately. The following are a few ways in which grouping of words can be helpful in vocabulary instruction:

Grouping words using color code:

This method can be explained by referring to a study by Bhavani (2017), who gives a tried and tested example of grouping of words using color code in her article "Vocabulary Instruction: Models Based on Classroom Experiments". This method was used by the scholar to discuss the intricate diction of Edgar Allen Poe's poem 'The Black Cat' with her undergraduate students. Firstly, the researcher read the poem aloud in the class with careful variations in the pitch and tone of her voice. Then the students were made to read the poem thoroughly and underline all the complex words with a colour that they think symbolizes their meaning. For instance: black for the word 'vile', red for the word 'atrocity', blue for the word 'tranquillity' etc. Students could use as many colours as they felt suitable to represent a word. Thereafter, all difficult words were described with an adequate number of synonyms. The students were told to see if the colours used by them

were representative of their meanings. This led students to make circumstantial guesses about the connotations of the words. The students were then asked to group the words as per the colours they had given. An illustration of the listed words is given below in Table 1:

Table 1: An illustration of the listed words

Red	Green	Black	Blue
Sagacious	Succinctly	fiendish	Imperceptible
Conflagration	Pertinacity	vile	Incumbent
Malevolence	Expedient	hideous	Inscrutable
Atrocity	Felicity	loathsome	Tranquility

This is only an instance and is not the whole list. The color implication may be individual but grouping should follow the reason of association/undertone. For example, in the table above, black color signifies the words connected to vehemence, offense, detest are grouped under the colour black.

This activity may be done within the text prescribed or text which a teacher chooses to take to the class. A teacher of professional communication/business communication may use some case studies, science fiction, and other relevant literature to teach technical/scientific vocabulary to their students. Further, to extend the activity, students may be given a few topics of paragraph/essay writing. They may be given a task on writing paragraphs/essays of 150 words using words in the table. Students will have a choice to use either all the words of a group in a topic or one word from each group in each of the given topics.

Grouping based on themes/issues: This is a very useful activity especially where some textbook is prescribed for the subject of English Language and Literature. However, a teacher may also collect literature relevant to the contents of a particular syllabus. This particular activity was conducted with the 1st year students of mechanical/electrical engineering for a common paper on English. The students were given 4 short poems and a short story to read and understand. They were given contexts like 'violence', 'globalization' and 'demonetization' etc. They were asked to find a minimum of 10 words from given literature that can be clustered for each of the contexts. It was indeed a brainstorming session for students and they came up with words to be used for each of the contexts.

For the context of Globalisation, the students prepared a list like this:

1. 'mighty', 'achievements', 'impelled', 'antique ponderous', 'unfathomed', 'spurning', 'teeming gulf', 'lofty', from section 1 of the poem "Passage To India" by Walt Whitman

2. 'gaunt', 'disengage', 'marred', 'presage' from the poem "Leisure" by Amy Lowell

3. 'estranged', 'bubbling', 'enthrall', 'business matters', 'snatched' from the poem "Reflections Irregular" by John Rollin Ridge

4. 'reign', 'tyranny', 'amendment', 'learning', 'infused', 'emulation', 'exaltation' from the essay "Of Custom And Education" by Francis Bacon

5. 'extinguished', 'subdue', 'importune', 'fortitude', 'enfranchise' from the essay "Of Nature In Men" by Francis Bacon

After students had grouped the words for each of the contexts, they were asked to write an essay of 150 words using the grouped words for their topics. Thus, the activity was quite useful in helping the students recognize not just the meaning of difficult words which they get exhibited too but also the apt usage of words.

B. Picture connection

In this activity, to begin with, the learners were provided a table of 30 words such as reluctance, tedious, cumbersome, perseverance, impetus, and sneaky, etc. They were then asked to identify the pictures that symbolize the meanings of these words. Various sources opted by the students included newspaper clippings, pictures from literary books, pictures from magazines, drawings, and images. The students were asked to compose a paragraph using these words together. They were free to choose their topics. The activity indeed facilitated the students to develop their ideas from a known situation they established through a picture to a new setting they tried to develop through paragraph writing. The words do not become a part of a student's creative vocabulary until or unless he/she uses them in a variety of contexts.

C. Techniques of Narration

Art of narration is another constructive method to facilitate students apply words correctly especially in teaching case studies and group discussions, which are an indispensable part of the B.Tech./B.E. curriculum in almost all the technical universities/institutes across the nation. The methods including object and word association, storyboard, etc can be put to use under this method.

a. **Object and word association:** In this activity, the entire class of B.Tech. (Mechanical Engineering) was asked to move around the campus and get any little object of their choice and then they were asked to gather in the communication lab. Every participant was asked this not object and one-word symbol to it. The entire class had

participated in this activity. The students got the objects like pebbles, pencil, green leaves, coke tins, instructions sheet, currency note of Rs. 10, comb, etc. The students were told to prepare a list of all the objects and connected words they would use to refer to the particular object. The list made was quite long and an example of the same is as follows:

1. Pebbles-hurdles, barriers
2. Pencil-literacy
3. Green leaves-vivacious
4. Juice bottles- rejuvenate
5. Instructions sheet-compliance
6. Currency note- economy
7. Comb-finesse

After this, the students were asked to create a narrative on any business-related issue using all the objects and their reference words. They could combine the objects and their connotative words with the condition that all the words in the list were to be used in the same form for narrative. With a constraint to use the same word forms and object, this activity inspired students to think creatively and develop a focused communication. For example the success story of a young entrepreneur.

b. **Storyboard**: Bhavani(2017) in "Vocabulary Instruction: Models Based on Classroom Experiments" endorses storyboard as another effective narration method. She refers to an experiment wherein "the students were given a list of random words and then were asked to log into the website, storybird.com. They were asked to choose any of the story templates of their choice, and using the list of words given, make as many story panels as possible. The students were able to create a single story using 5 story panels or used a single panel to create a single story. They had a limitation of using only 30 words per panel but had to use all the words given in the list" (p. 34). This activity also inspires learners to think innovatively. Moreover, the ready-made story sheets available on various online sources facilitate them to put their thoughts together and come up with a planned write up.

D. Description

The description is one of the most brainstorming tasks often opted by the teachers of communication skills for teaching students of engineering, management and media courses.

a. There are innumerable things and situations, students can be given to describe, from a newspaper/magazine snapshot of a current business/industrial event to a subjective description of some business tour. Descriptions may be both oral and written. The instructor may first guide the students through some examples and then may ask them to describe things/situations. The best part of this exercise is that instructions to use a minimum number of words about a particular field like sports, entertainment, weather, education, etc.

b. An excerpt of written text with gaps to be filled in with any word that fits is yet another important task of producing vocabulary. Instructions may be given to use a particular part of speech for filling the gaps like "noun", "adjective" or "adverb".

E. Use of Sports Vocabulary

In today's competitive world, a sport is not merely an activity with various sporting performances, coaches, players, spectators, sponsors, etc rather it is something that can be very instructive and can even fashion the ideological foundation of a society. Sports "communicate a large variety of ideas"(Hill, 2006, p.15).

Youth is a time characterized by budding independence and brimming vigor hence, sports are enjoyable and supposed to develop young people's skills and talents to the fullest. Even, it is sometimes seen as stimuli for the students who are unresponsive to academics. Indians are physically and culturally observed to be sportive people and nothing can be more inspiring to them than sports. A plain example of the same is how a large number of Indian teenagers remained stuck to their televisions for watching the full schedule of the Cricket World Cup 2019. Maybe many!

In their article "Using Sports Vocabulary to Strengthen English Language Skills of Engineering Students", Chandran and Mohanty (2019) refer to a small study conducted on electrical engineering students of NIT, Rourkela to examine whether the use of sports vocabulary in classroom assignments could influence and motivate the undergraduate engineering students to take more interest in English learning. Through feedback form and graphical presentation of the responses, the authors recommend that the specific vocabulary tasks based on sports may be provided to the students including preparation of a short, exciting presentation on one's favourite sport.

Guidelines may be provided on the format, content, and delivery of a presentation, etc. Students may choose to talk about the tools, techniques, rules, regulations, pitch/ground, the global recognition, short motivational stories of world-wide celebrities of their favourite sport. The peculiar of this method is that its application and utility are not just limited to the engineering students rather it can be customized and extended to a different set of students.

One important hitch in the use of this method is that students who are not interested in sports do not find this activity exciting and encouraging enough. Another significant observation is that some students become so much immersed in the sports stories that they tend to deviate from the real task of focusing on the vocabulary aspect.

CONCLUSION AND RECOMMENDATIONS

The ongoing discussion reveals that the productive modifications in language teaching pedagogy are certain and groundwork on the materials that would prepare learners to deal with the emerging trends to fortify their talent is the need of the hour. The conclusion is not only derived from the experimental results rather interactions with the students in the classroom. These interactions bear testimony to the fact that the use of creative pedagogy for teaching vocabulary to engineering students has a wide range of current and contextual significance. It keeps the students involved and focused in class. They talk vigorously about the increase in their self-confidence and vocabulary. Though the time spent in the classes was not enough to become fluent in English, the results show that students gained positively at the end of the course. Their capability to be able to articulate their ideas using the words appropriately in a small period is adequate evidence of the fact that creative pedagogy contributes to their lexical development.

ESL researchers go on with their discussions as to how language acquisition and learning relate to each other and how both might function simultaneously in the language classrooms. Ellis (1997) rightly states that SLA research findings may not provide clear-cut guidance for the teachers, but it offers a wide range of concepts that teachers can deduce and make better sense of their own classroom experiences. What is proposed in this paper is just an idea and its usefulness to engineering students but these can very well be customized and extended to a different set of students in any other context.

The usefulness of creative teaching pedagogy has not been fully realized because of the teachers' reluctance to think inventively. The novelty of the study lies in the fact that it will enable teachers to adapt to creative teaching pedagogy, identify appropriate creative pedagogical techniques and innovatively adjust their teaching practices to suit diverse classes.

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ਸੰਵਾਦ

ਤਤਕਰਾ

ਦੇਰੀਦਾ ਦੀ ਸਾਹਿਤ ਦ੍ਰਿਸ਼ਟੀ

ਦੇਰੀਦਾ ਵੀਹਵੀਂ ਸਦੀ ਦਾ ਉਹ ਚਿੰਤਕ ਹੈ ਜਿਸਨੇ ਦਰਸ਼ਨ, ਇਤਿਹਾਸ, ਸਾਹਿਤ, ਰਾਜਨੀਤੀ, ਆਦਿ ਵਰਤਾਰਿਆਂ ਸੰਬੰਧੀ ਪੂਰਬਲੀਆਂ ਚਿੰਤਨ ਪਰੰਪਰਾਵਾਂ ਦੀਆਂ ਸੀਮਾਵਾਂ ਦੀ ਪਛਾਣ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਆਪਣੀ ਅਸਲੋਂ ਨਵੀਂ, ਤਾਜ਼ਗੀ ਤੇ ਮੌਲਿਕ ਦ੍ਰਿਸ਼ਟੀ ਨਾਲ ਵਿਣ੍ਹ ਸਾਰੇ ਵਰਤਾਰਿਆਂ ਨੂੰ ਮੁੜ ਵਿਚਾਰਨ ਦੀ ਪਿਰਤ ਪਾਈ ਹੈ। ਸਾਹਿਤ ਤੇ ਸਾਹਿਤ ਸਮੀਖਿਆ ਦੇ ਖੇਤਰ ਵਿਚ ਉਸਨੇ ਆਪਣਾ ਮੌਲਿਕ ਦ੍ਰਿਸ਼ਟੀਕੋਣ ਸਾਹਮਣੇ ਰੱਖਿਆ ਹੈ। ਉਸ ਅਨੁਸਾਰ 'ਸਾਹਿਤ' ਸ਼ਬਦ ਦੀ ਵਰਤੋਂ ਹੁਣ ਤਕ ਬਹੁਤ ਹੀ ਸੀਮਿਤ ਪਰਿਪੇਖ ਵਿਚ ਹੁੰਦੀ ਰਹੀ ਹੈ। ਇਸਨੂੰ ਅਗਾਂਹ ਸਮੀਖਿਆ ਦੇ ਵੱਖ-ਵੱਖ ਸੀਮਿਤ ਪਰਿਪੇਖ ਪਰਿਭਾਸ਼ਿਤ ਵੀ ਕਰਦੇ ਰਹੇ ਹਨ ਤੇ ਇਸਦਾ ਸੰਚਾਲਨ ਵੀ ਕਰਦੇ ਰਹੇ ਹਨ। ਦੇਰੀਦਾ ਸਾਹਿਤ ਦੇ ਅਧਿਐਨ ਲਈ ਕੋਈ ਸਿਧਾਂਤ ਜਾਂ ਵਿਧੀ ਲੈ ਕੇ ਹਾਜ਼ਰ ਨਹੀਂ ਹੁੰਦਾ। ਉਸਦੀ ਰੁਚੀ ਤਾਂ ਸਾਹਿਤ ਦੇ ਵਿਹਾਰ ਵਿਚ ਹੈ।

ਦੇਰੀਦਾ ਦੀ ਸਾਹਿਤ ਦ੍ਰਿਸ਼ਟੀ ਦਾ ਸਭ ਤੋਂ ਮਹੱਤਵਪੂਰਣ ਪਹਿਲੂ ਇਹ ਹੈ ਕਿ ਇਹ ਸਾਹਿਤ ਤੇ ਦਰਸ਼ਨ ਦਰਮਿਆਨ ਸੀਮਾ ਰੇਖਾ ਖਿੱਚ ਲੈਣ ਤੋਂ ਇਨਕਾਰੀ ਹੈ। ਇਸ ਅਨੁਸਾਰ ਸਾਹਿਤ ਤੇ ਦਰਸ਼ਨ ਦੋਵਾਂ ਦੀ ਸਮੱਸਿਆ ਹੈ ਕਿ ਇਹ ਅਨੁਸ਼ਾਸਨ ਵਿਚ ਟਿਕੇ ਹੋਏ ਹਨ। ਦੋਵਾਂ ਨੇ ਆਪੋ ਆਪਣੀਆਂ ਹੱਦਬੰਦੀਆਂ ਪਰਿਭਾਸ਼ਤ ਕਰ ਰੱਖੀਆਂ ਹਨ। ਦੇਰੀਦਾ ਪ੍ਰਸ਼ਨ ਕਰਦਾ ਹੈ ਕਿ ਕੀ ਦਰਸ਼ਨ ਵਿਚ ਸਾਹਿਤ ਵਰਜਿਤ ਹੈ? ਜਾਂ ਸਾਹਿਤ ਵਿਚ ਦਰਸ਼ਨ ਦੀ ਸਮੂਲੀਅਤ ਦੇ ਸਿਲਸਿਲੇ ਵਿਚ ਸਾਹਿਤ ਦੀ ਸ਼ੁੱਧਤਾ ਉੱਪਰ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਕਿੰਨਾ ਜਾਇਜ਼ ਹੈ? ਅਸਲ ਵਿਚ ਦੇਰੀਦਾ ਲਈ ਦਰਸ਼ਨ ਜਾਂ ਸਾਹਿਤ ਦੀ ਥਾਂ 'ਲਿਖਤ' (writing)[2] ਵਧੇਰੇ ਮਹੱਤਵਪੂਰਣ ਸ਼ੈਅ ਹੈ ਕਿਉਂ ਜੋ 'ਲਿਖਤਾ' ਹਰ ਪ੍ਰਕਾਰ ਦੇ ਪ੍ਰਵਰਗਾ, ਅਨੁਸ਼ਾਸਨਾ, ਵਿਰੋਧਤਾਵਾਂ ਤੋਂ ਪਾਰ ਜਾ ਸਕਣ ਦੀ ਸੰਭਾਵਨਾ ਰਖਦੀ ਹੈ। ਇਹ 'ਲਿਖਤ' ਹੀ ਦੇਰੀਦਾ ਅਨੁਸਾਰ ਸਾਹਿਤ ਹੈ ਤੇ ਇਹ 'ਲਿਖਤ' ਹੀ ਦਰਸ਼ਨ ਹੈ:

ਮੇਰਾ ਸੁਪਨਾ ਇਕ ਅਜਿਹੀ ਲਿਖਤ ਦਾ ਹੈ ਜੋ ਨਾ ਪੂਰੀ ਤਰ੍ਹਾਂ ਦਾਰਸ਼ਨਿਕ ਹੈ ਤੇ ਨਾ ਹੀ ਪੂਰੀ ਤਰ੍ਹਾਂ ਸਾਹਿਤਕ। ਇਹ ਸੁਪਨਾ ਮੇਰਾ ਹੀ ਨਹੀਂ, ਸਗੋਂ ਹਰ ਉਸ 'ਆਦ ਹਰ ਵਿਚ ਆਉਣ' ਵਾਲੇ ਅਨੁਸ਼ਾਸਨ ਦਾ ਹੈ ਜਿਹੜਾ ਪੂਰਬਲੇ ਜਾਂ ਪੂਰਬਲੇ ਦੇ ਅਨੁਸਾਸਿਤ ਵਿਧਾਨ ਤੋਂ ਮੁਕਤ ਹੋਣਾ ਲੋਚਦਾ ਹੈ।[1]

ਜਾਵੇ ਦੇਰੀਦਾ ਦਰਸ਼ਨ ਤੇ ਸਾਹਿਤ ਦੇ ਅੰਤਰ ਨੂੰ 'ਲਿਖਤ' ਦੇ ਰੂਪ ਵਿਚ ਮਿਟਾ ਦਿੰਦਾ ਹੈ ਪਰ ਫਿਰ ਵੀ ਉਹ ਲਿਖਤ ਦੀ ਮੌਲਿਕਤਾ ਲਈ

ਡਾ. ਸਤਪ੍ਰੀਤ ਸਿੰਘ ਮਾਨ
ਅਸਿਸਟੈਂਟ ਪ੍ਰੋਫੈਸਰ
ਪੰਜਾਬੀ ਵਿਭਾਗ
ਨਿਹਾਲ ਹੰਸਰਾਜਾ
ਯੂਨੀਵਰਸਿਟੀ
ਧੂਰੀਆਣਾ
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Question Answering based Dialogue System in Punjabi language

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Abstract. At present many fields of Natural Language Processing (NLP) come into existence with highly advanced applications and technology. Question Answering Based Dialogue System is an application of Natural Language Understanding (NLU). It has now become top choice for the researchers. In the Question Answering Based Dialogue System (QABDS) user gives questions or queries to the system to obtain correct and accurate answers. By using this system, a user gets valid and accurate answers to the natural language questions instead of SQL query. In this paper we have proposed a comparison of QABD systems and found some research gaps in these systems. Based on this we are introducing an NLP based QABD system for an Indian Language 'Punjabi'.

Keywords: Dialogue system; Natural language processing; Natural language understanding

1   Introduction

A computer program that interacts with human in a natural way is called the Dialogue System. The dialogue system provides an interface between user and computer based application. This interaction of human user with the computer based application is in natural manner. Question Answering Based Dialogue (QABD) System is a method used to extract the needed information from a structured database or the web. For this purpose, the system needs to understand the query in native language. To understand the user's query the approach is to comprehend the linguistic point of view of the query and understand what the user wants to ask. These tasks are performed by different components of the system. These components interact with each other to give correct answer to the user.Different Dialogue Systems have different architectures but they are composed of components which are Input Recognition, Natural Language Understanding, Dialogue Management, Response Generator and Output Renderer. [1]

Today, there is huge amount of information is available on the web. User expects concise, correct and comprehensible answer from the web in their native language for his queries. User don't want to be restricted to a specific query language, query formulation rules, linguistic knowledge etc. while search engine provide ranked list of websites, documents etc. So there becomes vital need of Question Answering Dialogue System.*Question Answering Dialogue System (QADS)*is an advance Web based assistant to users in Punjabi for accessing public website rather than Keyword search or Menu driven navigations or FAQs.Some popular languages that people of India speak are Hindi, Punjabi, Malayalam, Telugu, Marathi, Bengali etc. Currently researchers are considering these Indian languages to work in the field of natural language processing. Millions of people around India & Pakistan have mother tongue Punjabi and also in America, Canada and Europe.In this paper we discuss QADS, terminology used in Natural Language Processing (NLP), history of QADSs,design of system and dialogue flow. In the end we conclude with future research in this field. This paper also illustrates how computer give reply to the user in natural language text of the natural language query or question given by user.

2   Natural Language Processing

Natural Language is that language which is written or spoken by human for general purpose communication e.g. Punjabi, Hindi and English etc. Natural language processing permits computers to extract meaning from the words and phrases that persons use and respond in a similar way once presenting information back to them. It include:-

- Natural Language Understanding(NLU)
- Natural Language Generation (NLG)
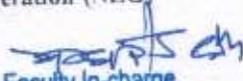
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as information-seeking dialogues. The system tries to elicit enough information from the user as is needed to search for the information that the user wants.

The methodology applied and steps followed to answer a particular question by the system are described below with following example and work flow is shown in Figure - 1

User: what is the fee of MCA Course in General Category at ACET College?

System:The fee of MCA course in ACET College is 50000.
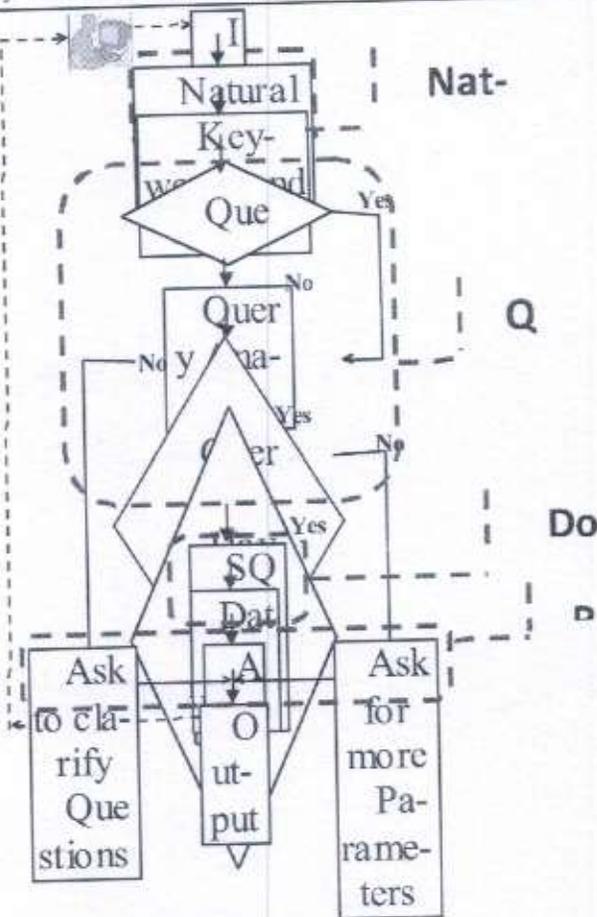
Figure 1: Work Flow Diagram of Dialogue System

5.1 Punjabi Language Input Text

In this, input is taken from the user. User can provide input text in Punjabi language or user can use phonetic typing or Punjabi transliteration for inputting the Punjabi text.

User: A.C.E.T college vichM.C.A. course di general category di fees dasso?

5.2 Natural Language Understanding

Natural language text is taken as input and used for understanding. In this phase system identifies tokens. This component converts input text words into keywords & tokens that can be used by query frame analyzer.

Tokens: what is the fee of MCA Course in General Category at ACET College?

Keywords:MCA, General Category, Course, ACET , College.

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by Computer" in English language. Further, other work is done by Grosz, Sparck Jones and Webber on articles PLANES [4], LADDER [5], and TEAM [6] respectively. Review of work through 1990 is done by Copestake and Sparck Jones [7].The most prominent early work here is START [8] and it is still running on the World Wide Web since1993. START uses decomposition based on syntactic analysis approach to answers complex questions. Over the years, Question answering system is emerging rapidly. There is huge improvement in the field of Natural Language Processing (NLP) from the last decade e.g. research has been carried on Hindi, Punjabi, Telugu, Bengali, Malayalam languages etc. such as Sekine et al. (2003) [9]launched Hindi-English cross lingual QA system. This system accepts and responds in English language by taking the input from Hindi newspaper.In the following sections, we are classifying the QA systems.

3.1 Rule Based Q A System

Rules Based Systems can apply to implement lexical analysis in natural language Processing [10]. An example of Rule based systems are domain dependent Expert System that used to specify rules or choices [11]. A variety of algorithms are also developed to process the documents such as Gupta et al. (2013) [12] described an algorithm for accepting user's query in Punjabi and a paragraph text as input from which answer are to be extracted.

3.2 IR/IE Based Q A System

Information Retrieval (IR)/Information Extraction (IE) [13] are the attractive areas for research. Users ask the query and system gives answer in the form of documents with relevant passages. The IE community developed the Message Understanding Conferences (MUC) for its own evaluation and which ran between 1987 and 1998. Besides this, Chung et. al. (2007) [14] developed QA and IE engine to obtain weather information from the website. Contrasting others, Sahu et al. (2012) [15] has followed the QA system using Query Logic Language (QLL) and Hindi shallow parser which is developed by IIIT Hyderabad. They developed architecture for the QA system and involved the various modules such as Query Processing, Query Generation, DB search etc. The given QA system gives the response to users in Hindi Language. The system handles on four types of questions where, when, what & how many types of questions.

3.3 Web Based Q A System

A very large amount of information is available on the Internet. It is considered best source to obtain the information. Web based QA systems depend on the search engines to provide the potential web pages containing answers to the questions of the users. This method provides the answers in text documents, PDF, XML documents, Wikipedia etc. The data on the web has heterogeneity, distributive and semi structure properties. There are two most popular techniques for QA systems. These are Open Domain System and Restricted Domain QA System [16] while Web based QA systems work for open domain [17]. TREC is the major scale evaluation environment for open domain QA system. TREC is focused to build a fully automatic open-domain QA System. This system can answer a huge variety of questions based on a large amount of data. Kumar et al. (2005) [18] introduces a light weight stemmer for Hindi and also developed case-based rules to classify the question. Stalin et al. (2012) [19] implemented the web based QA system that retrieve the answers from Hindi documents for user's query in Hindi language. Again, Gupta (2013) [20] has proposed a technique of question answering for Punjabi and English text.

3.4 Restricted Domain Q A System

Restricted domain QA Systems are under specific domain queries and are related to that particular domain [21] and based on general corpus provides a list of documents. Therefore, restricted domain gives more accurate result as compared to listing a set of related websites and documents.

In recent years, closed domain systems and open domain systems has emerged very fast. Currently, users have no time to search the particular information from the web. So, Question answering dialogue system becomes worthy and provides unerring information but in a restricted domain. As we start from near the beginning systems, these are very restricted to the domain and provide limited information of the user's query. The famous early program with restricted domain was BASEBALL [22], a program to provide answers about one season of American league but domain is limited to baseball only.

SHRDLU [23] is perhaps the first AI System to take the user query and send back respond to the user.The SHRDLU system performs to control the robot hand which help to arrange the blocks as requested by the user. The GUS(Genial Understand System) [24] system is developed to help the travel advisor on restricted domain about Airlines Flights. AFter this system, many upcoming systems follow the same approaches to retrieve appropriate data in restricted domain.

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Another well remembered system in this practice is the LUNAR system. This system provides the simple way to access, compare and assess the chemical analysis data of Lunar Rock [25]. Early dialogue system such as UC (Unix Consultant) [26] and The Berkeley Unix Consultant project (UC) gives the reply of user's question about UNIX operating system [27]. One more early dialogue system is GENIES [28]. It is developed in 1999. The system extracts structured information related to molecular pathways. Subsequently another method implemented by Reddy et al. (2006) [29]. They introduced the Question answering based dialogue system in Telugu Language for Indian railways. Another QA system based on Hindi language is proposed by Sinha (2006) [30]. The system uses same approach for Railway in Hindi Domain along with system using shallow syntactic and semantic analysis on the input query. Moreover, Godavarthy et al. (2007) [31] has discussed the dialogue management with multilingual restricted domain QA system for Bengali and Telugu language. By following the same practice, another work in this line is done by Kangavari et al. (2008) [32] developed a system to retrieve accurate answer in the domain of "weather forecasting". QUARS(2016) [33] system is a keyword based system, employed for an Indian Railways System in Hindi language for Northern India.

A survey of various restricted domain Question Answering systems has been mentioned in Table 1

Table 1.Comparison table of various systems

SR NO	SYSTEM	ACCURACY	QA TYPE	MODEL/TECHNIQUE FOR QUERY PROCESSING	LIMITATIONS
1.	BASEBALL [22]	Not given and Unsatisfied results	Restricted Domain	Linguistic, Semantic Analysis	1. Questions are limited to a single clause. 2. *and, or, not* are prohibited. 3. Semantic ambiguities unsolved
2.	SHRDLU [23]	Quiet accurate	Restricted Domain	Backward chaining or means-ends analysis	Not useful for commercial field
3.	Lunar [25]	90%	Restricted Domain	Syntactic and semantic analysis	Narrow domain
4.	UNIX Consultant [26]	Good efficiency	Restricted Domain	Minsky's theory of frames	Narrow domain
5.	The Berkeley UnixConsultant Project [27]	Quiet Satisfactory	Restricted Domain	Language analysis using ALANA	1. Components are not integrated i.e. flow of the system unidirectional 2. repeated question responds no answer
6.	GENIES[28]	Precision=96 % Recall=63%	Restricted Domain	Own architecture using MedLEE	1. Incomplete lexicon 2. Grammar rules are incomplete
7.	START[8]	Satisfactory Results	Open Domain	Morphological, semantic and syntactic analysis	Unstructured data because of open domain
8.	Hindi-English cross-lingual question answering system [9]	Each component is calculated separately but accuracy is Acceptable	Open Domain	Monolingual QA systems with Named Entity Tagger	Errors in Keyword translation
9.	Hindi Question Answering system for E-learning documents[18]	Directly answered of the questions=75% Directed to the relevant document=12%	Open Domain	A light – weight stemmer for Hindi & case based rules to classify the Question	To lack of clear boundary between classes of classification & inadequate use of syntactic information.
10.	Dialogue based Question Answering System in Telugu [29]	Dialogue success rate = 83.98% Precision =96.34%	Restricted Domain	Architecture consists of Query analyzer, query frames, dialogue manager, dialogue history , SQL generation and answer generation	Query frames for some natural language queries were not correctly identified.
11.	A Practical QA System in Restricted Domains [14]	Precision =90.9% Recall = 75.0%	IR/IE	QA system with QA system and IE engine	1. Insufficient data of weather domain ontology 2. Error due to query frame analysis 3. Low recall rate due to invalid data and topic.
12.	Multilingual Restricted Domain QA System with Dialogue Management	**Without Dialogue Management:** Bengali System: Precision=85.70%	Restricted Domain	Shallow parser	NLP queries are not perfectly identified and some queries are out of database coverage. Unable to obtain in chunks, so generating wrong

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				answers.
(Bengali and Telugu) [31]	Recall=80% Telugu System: Preci-sion=97.63% Recall=93.93% **With Dialogue Management:** Bengali System: DSR −72.91% Precision= 83.67% Telugu System: DSR=89.06% Precision −96.49%			
13. A New Model for Question-Answering System [32]	**Version no.1** (based on fixed pattern which user cannot change)=70% **Version no. 2** (based on system can check the dictation of word)=90%	Restricted Domain	Syntax n semantic analysis	Low accuracy due to query reformulation due to syntax and semantic relation
14. Prashuottar [15]	68%	IR/IE	Hindi Shallow Parser using Query logic language (Q.L.L.)	Accuracy of Question type 'Where' is low because the answer type of this question is Proper noun i.e. location.
15. Web Based Application for Hindi Question Answering System [19]	Inconclusive Result	Restricted Domain	POS tagging	Less semantic implementation of answer extraction
16. Algorithm for Punjabi Question Answering System [12]	Average accuracy =73%	Restricted Domain	Develop step algorithm and hybrid model (Pattern matching +new proposed answer finding scoring system)	Do not support which, how much, how many type of questions.
17. A Proposed Online approach of English and Punjabi Question Answering [20]	Accuracy of half implementation=70%	Open Domain	Architecture consists of-query analysis, query generator, open websearch, snippet extraction and answer ranker	1.Insufficiency of consistency 2. Punjabi dictionary is not correct
18. QUARS[33]	Precision−99.4% Recall 98.8%	Restricted Domain	Keyword based approach	Sometime key word not found

4   Purpose of Study

Every QA system has its own limitations. Some have similar limitations such as insufficient data of domain in Database (DB). Also they have some more limitations i.e. error due to Query Frame Analysis and another error was caused by the flaw of keyword based Query Frame Decision approach. Our proposed system will achieve the 100% accuracy to extract the correct keyword from the user's query and further it will also generates the correct query frame through look up table method. While some other systems follows question classification approach due to this some type of questions are not identified by these QA systems. In addition to this, some systems have Word Error Rate (WER) for some restricted words. Our proposed system has also limitation of some restricted vocabulary but it also overcomes the various limits of above mentioned approaches. Our System has sufficient data related to domain in Database. It does not support question classification, so provides better results.

5   System Design

The purposed system is based on the Information seeking domain. A common application of dialogue systems is as a frontend to a database. Here the dialogue system acts as a natural language interface, and such dialogues are referred to

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5.3 Query Frame Analyzer

From these tokens this component tries to make semantic representation that could identify the query frame from the user input. These tokens help deciding proper query frame. These tokens help deciding proper query frame. Following are the cases arises

Frame is complete - If the frame is already complete then query will be generated by the SQL Generator.

Frame is incomplete – If the system is not able to make decision on the query frame then system starts the dialogue with the user through the dialogue manager.
In our example our Query Frame is selected as following query frame.
Fee (College, Course, Category)

5.4 Domain Specific Component

After selecting the appropriate query and acquiring all parameters. SQL query is executed for the answer from the database. Following is the query

Select AMOUNT from FEES where college='ACET', course='MCA' and category='GENERAL'

The database contains the information about the Colleges, Course, fees and number of intake etc. SQL query is than executed against database and the result is given to the Dialogue Manager. Following is the result of the query.

50000

5.5 Response Generator

This phase constructs the message that is to be shown to the user. Dialogue manager makes the decision regarding choice of words and syntactic structure. It also take care of regarding what information should be included and how the information should be structured t form the message.

System: System:The fee of MCA course in ACET College is 50000.

6 Discussion and Future Aspects

The purpose of QA system is to provide accurate, definite and precise answers to users rather than to offer documents or ranked website links. In this paper, we discussed several existing QA systems, their applied tools and techniques, various approaches, algorithms and models to retrieve appropriate and unambiguous answers. A review of various QA systems has been shown in this paper. Researchers used morphology, POS tagging, syntactic and semantic tools etc. to process the query input and further to generate the accurate answer.The produced results are fairly acceptable and satisfactory.The results are good because of consideration of specific domain. The limited domain filters the choice of question asked by user but the results can be improved. In many models, dialogue manager and query processing are the main components of the common system architecture. We can improve the query processing module with the addition of their own logic because as we can observe from comparison table that their own developed architecture provides the more accurate results as compare to morphological, syntactic and semantic analysis etc. tools applied on general architecture.

In future, systems will have to consider multimedia data. Systems should consider audio, videos, images, metadata etc. Thus, QA system is all about human computer communication, to understand and interpret query and intelligent tutor system.

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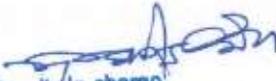
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Dialogue System in context with Natural Language Processing

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Abstract:
A Dialogue System is a system which interacts with human in natural language. At present many universities are developing the dialogue system in their regional language. This paper will discuss about dialogue system, its components, challenges and its evaluation. This paper helps the researchers for getting info regarding dialogues system.

Keywords: *Dialogue System, Natural Language Processing. Generator.*

1. Introduction

A Dialogue is a conversation between two or more agents, be they human or machine. Research on dialogue is on two topics human-human dialogue and human-computer dialogue. The later is involved in a Dialogue System, a computerized system whose aim is to interact with humans in a natural language. Today dialogue system is developing in text, graphical, spoken and multimodal systems.

2. Dialogue System

A dialogue system is a computer program that communicates with a human user in a natural way.[1] The dialogue System provides an interface between the user and a computer-based application that permits interaction with the application in a relatively natural manner. The System can be CUI, GUI, VUI and multi model etc. it can be used in telephones, PDA systems, cars, robot systems and web browsers. A text based dialogue system is in which we chat with the system. A spoken dialogue systems is defined as a computer systems that human interact on a turn-by-turn basic and in which spoken natural language interface plays an important part in the communication.[2] A multimodal dialogue systems are those which are dialogue systems that process two or more combined user input modes - such as speech, pen, touch, manual gestures, gaze, and head and body movements - in a coordinated manner with multimedia system output.[3] Different Dialogue Systems have different architectures but they have same set of phases which are Input Recognition, Natural Language Understanding, Dialogue Management, Response Generation and Output Renderer.[4]

3. Components of Dialogue System

A Dialogue system has mainly seven components.[5] These components are following:

- **Input Decoder**
- **Natural Language Understanding**
- **Dialogue Manager**
- **Domain Specific Component**
- **Response Generator**
- **Output Renderer**

- For these tasks dialogue manager has many components these components are:
- Dialogue Model
- User Model
- Knowledge Base
- Discourse Manager
- Reference Resolver
- Grounding Module
-

3.4 Domain Specific Component

The Dialogue Manager usually needs to interface with some external software such as a database or an expert system. The query or plans thus have to be converted from the internal representation used by the dialogue manager to the format used by the external domain specific system (e.g. SQL). This interfacing is handled by the domain specific components. This can be handled by Natural Language Query Processing system. This system generate SQL query from natural language.

3.5 Response Generator

This component involves constructing the message that is to be given by the user. It takes decision regarding what information should be included, how information should be structured, choice of words and syntactic structure for message. Current systems use simple methods such as insertion of retrieved data into predefined slots in a template.

3.6 Speech Generation

It translates the message constructed by the response generation component into spoken form. For speech generation two approaches may be used. The first approach is to use prerecorded canned speech may be used with spaces to be filled by retrieved or previously recorded samples e.g. *"Welcome, how can I help you."* The second approach is use text to speech synthesis. In this speech is generated of text. It is called Contaminative Speech Synthesis, Text to Phoneme conversion and Phoneme to speech conversion or Text to Speech (TTS).

4. Classification of Dialogue System

On the basis of method use to control dialogue a dialogue system can be classified in three categories[6]:

- Finite State (or graph) based systems
- Frame based systems
- Agent based systems
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4.1 Finite State based Systems

In these types of systems the user is taken through a dialogue consisting of a sequence of predetermined steps or stages. The flow of dialogue is specified as a set of dialogue states. Following is the example:

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3.4.5 Number of research papers per teacher in the Journals notified on UGC website during the last five years (15)

3.4.5.1: Number of research papers in the Journals notified on UGC website during the last five years

Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal
Derrida Di Sahit Drishti	Sarabjit Singh	Department of Humanities Languages & Cultural Studies, I.K Gujral Punjab Technical University, Main Campus, Kapurthala	Sanvad	2020	2395-1273	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList
Question Answering based Dialogue System in Punjabi Language	Sarabjit Singh	Department of Humanities Languages & Cultural Studies, I.K Gujral Punjab Technical University, Main Campus, Kapurthala	Think India	2020	0971-1260	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList
Dialogue System in Context with Natural Language Processing	Sarabjit Singh	Department of Humanities Languages & Cultural Studies, I.K Gujral Punjab Technical University, Main Campus, Kapurthala	Indian Place Names	2020	2394-3114	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList
Emerging Need To Rethink Language Pedagogies In Indian Technical Education: Creative Pedagogy A Better Approach For Vocabulary Instruction	Priyanka Mahajan	HLCS, IKGPTU Main Campus	Humanities & Social Sciences Reviews (Scopus Indexed/ UGC-CARE List -Group II)	2020	2395-6518	https://ugccare.unipune.ac.in/Apps1/User/WebA/CAREList https://www.scopus.com/sources.uri

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