

# Fuzzy logic based approach for Computational English Language Teaching & Learning

Krishnaveer Abhishek Challa

*Soft Skills Trainer cum Faculty, Department of Foreign Languages, Andhra University*

*PhD Research Scholar, Department of Linguistics, Andhra University*

*Secretary, Linguistics Research Society*

*Visakhapatnam, India Cell No. 9908742869*

**ABSTRACT:-** It is quite impractical for a teacher to monitor the learning status of all the students in a class. So the computers are being used as tools to teach and evaluate students individually in current educational institutions. But the available software cannot replace the instinct and capability of a teacher due to its logical limitations. In this paper, a fuzzy logic based approach is presented to build a teaching program which can identify and track the status of every student based on his/her calibre. The program is designed to teach a language (English in this case). Since it is challenging to teach the concepts of language to a student through cyber medium, it is implied that this proposal can also be mapped to subjects other than languages.

**Keywords:-** New media, CALL, Fuzzy logic, English Language Learning, Internet, Information and Communication Technology (ICT)

## I. INTRODUCTION

Using various kinds of Media in the classroom has always been a challenge, and how to bring these Media in the classroom is more than a challenge. Students and teachers should be able to use in their classrooms different media through different technologies. Media provide teachers and students with creative and practical ideas. They enable teachers to meet various needs and interests of their students. They also provide students with a lot of language practice through activities using newspapers, magazines, radio, TV, movies, books, Internet, etc, and tasks which develop reading, writing, speaking and listening skills. They entertain students and encourage reading English in general, both inside and outside the classroom, promoting extensive reading by giving the students the confidence, the motivation and the ability to continue their reading outside the classroom. (Tafari, 2009)

The new era assigns new challenges and duties on the modern teacher. The tradition of English teaching has been drastically changed with the remarkable entry of technology. Technology provides so many options as making teaching interesting and also making teaching more productive in terms of improvements. Technology is one of the most significant drivers of both social and linguistic change. Graddol: (1997:16) states that "technology lies at the heart of the globalization process; affecting education work and culture.

The use of English language has increased rapidly after 1960. At present the role and status of English is that it is the language of social context, political, sociocultural, business, education, industries, media, library, communication across borders, and key subject in curriculum and language of imparting education". It is also a crucial determinant for university entrance and processing well paid jobs in the commercial sector. Since there are more and more English learners in India, different teaching methods have been implemented to test the effectiveness of the teaching process.

As the use of English has increased in popularity so has the need for qualified teachers to instruct students in the language. It is true that there are teachers who use 'cutting edge' technology, but the majority of teachers still teach in the traditional manner. None of these traditional manners are bad or damaging the students. In fact, till date they are proving to be useful also. However, there are many more opportunities for students to gain confidence practice and extend themselves, especially for ESL students who learn the language for more than just fun. For them to keep pace with ELT and gain more confidence they have to stride into the world of Internet that has multimedia technology. (Shyamlee, 2012)

21<sup>st</sup> century is the age of globalization and is important to grasp on various foreign languages and English language comes first. English Language Teaching has been with us for many years and its significance continues to grow, fuelled, partially by the Internet. Graddol's study (2000) suggests that in the year 2000 there were about a billion English learners- but a decade later the numbers doubled. The forecast points to a surge in

English learning, which has peaked in 2010. The same study indicates that over 80% of information stored on the internet is in English. For the first time there are more Non-Native than Native users of the language and diversity of context in terms of learners, age, nationality, learning background etcetera has become a defining characteristic of ELT today.

There is an extensive literature discussing the value of the internet in education in general and for second language teaching and learning in particular (e.g., Macdonald et al. 2001, Hill et al., 2005, Lewis, 1999). Researchers have drawn attention to a number of factors that could make the internet a very important tool for second language teaching and learning. Firstly, research has found that using the internet in the second language classroom can increase students' motivation. For example, Warschauer (1996) found that students think computers can help them learn better, faster, write more creatively and more independently. He also found that communicating with others could enhance motivation and personal power, overcome isolation and make communication less threatening.

## **II. ENGLISH FROM INTERNET**

Mark Warschauer and Deborah Healey, as quoted by Crystal (2006: 266) mentioned that the Internet is one of the factors that have important contribution in the advancements of the use of computers for language learning. They states that "It is the rise of computer-mediated communication and the Internet, more than anything else, which has reshaped the uses of computers for language learning at the end of the 20th century (Eastment 1996). With the advent of the Internet, the computer-both in society and in the classroom – has been transformed from a tool for information processing and display to a tool for information processing and communication. For the first time, learners of a language can now communicate inexpensively and quickly with other learners or speakers of the target language all over the world."

Hence, it can be stated among the various advantages, the first and the main advantage or benefit of using the Internet for teachers is the fact that it provides a large amount of teaching resources. It is through the Internet that teachers could easily get various materials for their teaching. Some primary sources include: <http://www.onesstopenglish.com/> which features plenty of materials and lesson plans for regular use and the BBC/ British Council collaboration also has plenty of resources on its Teaching English site at <http://www.teachingenglish.org.uk/> (Dudeney, 2007: 152).

The abundant English language media resources are also available from the some other sites or some online newspaper and magazines as the following (Warschauer, Shetzer and Meloni, 2002: 23-24)

1. Digital Libraries Initiative (<http://dli.nsf.gov>).
2. Literature Online (<http://lion.chadwyck.com>).
3. Newspapers Online (<http://www.newspapers.com>)
4. The Times (<http://.the-times.co.uk>)
5. The New York Times (<http://www.nytimes.com>)
6. The Washington Post (<http://www.washingtonpost.com>)
7. The Wall Street Journal (<http://www.wsj.com>)
8. The Sydney Morning Herald (<http://smh.com.au>)
9. Time (<http://www.time.com>)
10. Newsweek (<http://www.newsweek.com>).
11. CNN.com (<http://www.cnn.com>)
12. BBC Online (<http://www.bbc.co.uk>)
13. The New York Times Learning Network (<http://www.nytimes.com/learning>)
14. BBC School Online (<http://bbc.co.uk/education/schools>), and
15. Learning Resources at <http://literacynet.org/cnnsf> which is developed jointly by CNN San Francisco and Western/Pacific Literacy Network.

The second benefit of using the Internet in the practice of English language teaching for teachers is the fact that it is through the internet that teachers can get much information not only in terms of material for their teaching but also to improve their own knowledge by reading or writing in the journal related to English language teaching and learning. The following are some professional journals and magazines which are provided online on the Internet (Warschauer, Shetzer and Meloni: 2005: 22).

1. TESL-EJ (<http://www.kyoto-su.ac.jp/information/tesl-ej>) which focuses on the theory and practice of language teaching;
2. The Internet TESL Journal (<http://www.aitech.ac.jp/~iteslj>), which includes short, practical articles;
3. Language Learning & Technology (<http://polyglot.cal.msu.edu/llt>), a research journal for second language educators;
4. CALL-EJ Online (<http://www.lerc.ritsumeji.ac.jp/callej>) which covers computer-assisted language learning; and

5. Kairos (<http://english.ttu.edu/kairos>), a journal on computer and writing

The third benefit of using the Internet in the practice of English language teaching for teachers is the fact that it is through the Internet that teachers can exchange information and get connected with other teachers from different countries having the same interest or field. They may send an email or even chat with other English teachers from other places. They may also join international professional organizations to maintain frequent contact with the organizations. (Sudartini, 2010)

Warschauer, Shetzer and Meloni (2005: 24) identify some international professional organizations having their own Web sites. The following is the list of those organizations.

1. TESOL (<http://www.tesol.org>).
2. The International Association of Teachers of English as a Foreign Language (IATEFL, <http://www.iatefl.org>)
3. The Japan Association for Language Teaching (JALT, <http://www.jalt.org>)
4. NAFSA or Association of International Educators (<http://www.nafsa.org>)
5. National Council of Teachers of English (<http://www.ncte.org>)
6. The American Association for Applied Linguistics (<http://www.aal.org>)
7. The Linguistic Society of America (<http://www.lsad.org>)
8. The American Council on the Teaching of Foreign Languages (<http://www.actfl.org>)
9. Computer Assisted Language Instruction Consortium (CALICO, <http://www.calico.org>)

Secondly, Godwin-Jones (2003) and Salaberry (2001) argue that the internet offers the potential for a huge increase in learner-learner and learner-teacher interactions. According to Luan et al. (2005), teachers and students who use the internet are not bound by traditional modes of learning; their interactions with one another are immediate, prompt and widely shared. Thirdly, the collaborative nature of learning is increasingly important in education and the internet provides rich opportunities for interaction with other people, reciprocal exchanges of support and ideas, joint work on the development of performances and products, and co-construction of understandings through comparing alternative ideas and interpretations (Lock & Redmond, 2006).

Moreover, students can use the internet to acquire information from a large number of sources for a variety of purposes (Shetzer & Warschauer, 2000, Hill, et al., 2005, Warschauer, 2000, Singhal, 1997). Finally, technology is a strong catalyst for educational innovation, especially when the internet is involved (Venezky, 2004). Coppola (2004) argues that technology is vital to the educational reform process.

### III. CONSTRUCTION OF FUZZY MODEL

In general there are two approaches for constructing fuzzy models:

1. Identification of fuzzy modeling, using input-output data and
2. Derivation from given nonlinear system equations.

There has been an extensive literature on fuzzy modeling using input-output data following Takagi's, Sugeno's, and Kang's excellent work w8, 9x. The procedure mainly consists of two parts: structure identification and parameter identification. The identification approach to fuzzy modeling is suitable for plants that are unable or too difficult to be represented by analytical and physical models. On the other hand, nonlinear dynamic models for mechanical systems can be readily obtained by, for example, the Lagrange method and the Newton-Euler method. In such cases, the second approach, which derives a fuzzy model from given nonlinear dynamical models, is more appropriate. This section focuses on this second approach. This approach utilizes the idea of "sector nonlinearity," "local approximation," or a combination of them to construct fuzzy models.

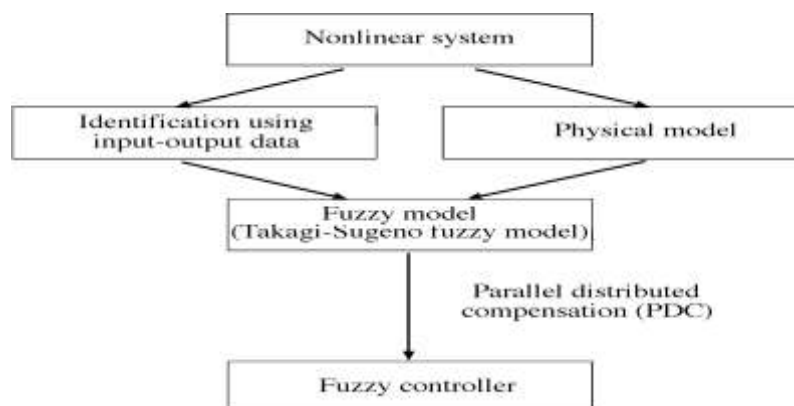


Fig 3-1 Model based Fuzzy control design

#### IV. SECTOR NON-LINEARITY

The idea of using sector nonlinearity in fuzzy model construction first appeared in [10]. Sector nonlinearity is based on the following idea. Consider a simple nonlinear system  $x'(t) = f(x(t))$ , where  $f(0) = 0$ . The aim is to find the global sector such that  $x'(t) = f(x(t)) \in [a_1 a_2] x(t)$ . Figure 3.1.1 illustrates the sector nonlinearity approach. This approach guarantees an exact fuzzy model construction. However, it is sometimes difficult to find global sectors for general nonlinear systems. In this case, we can consider local sector nonlinearity. This is reasonable as variables of physical systems are always bounded. Figure 3.1.2 shows the local sector nonlinearity, where two lines become the local sectors under  $-d < x < d$ . The fuzzy model exactly represents the nonlinear system in the "local" region, that is,  $-d < x < d$ .

The following two examples illustrate the concrete steps to construct fuzzy models.

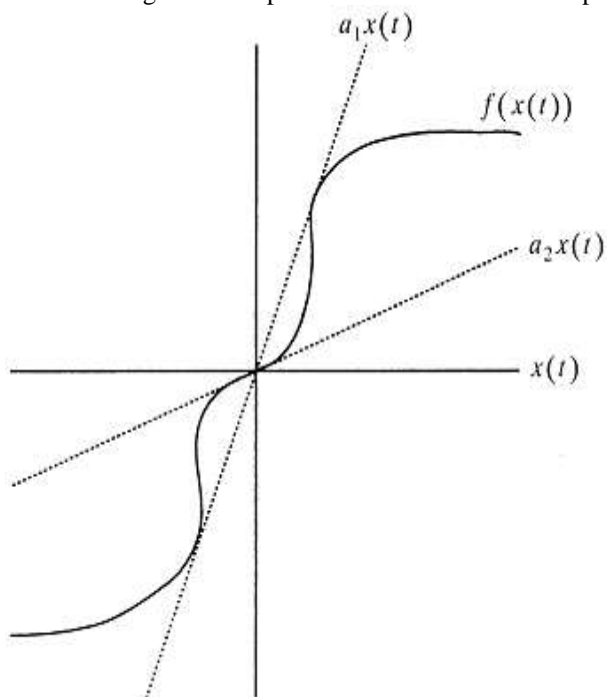


Fig 3.1.1 Global Sector Non Linearity

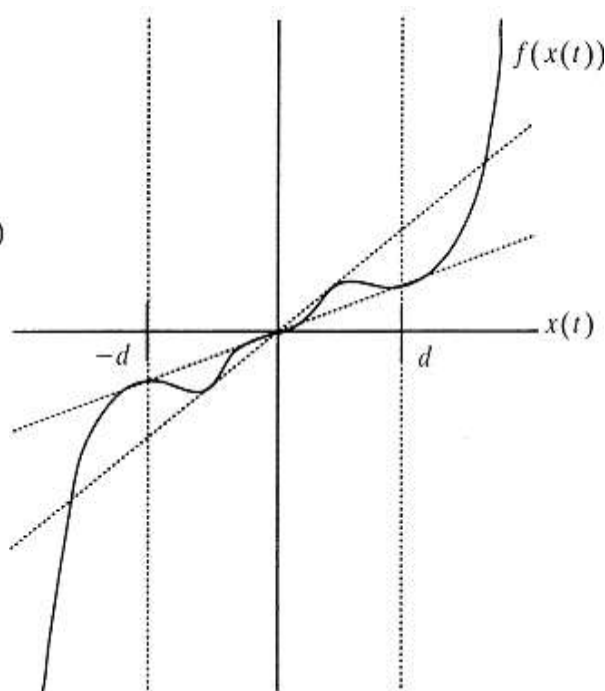


Fig 3.1.2 Local Sector Non Linearity

#### V. CONCLUSION

In line with the important roles of internet in English Language teaching, the use of internet in the practice of English language teaching is unavoidable. In general, the use of internet in English Language teaching contexts provides many benefits both for teachers and students as Lee, Jor and Lei (2005: 4) claim that innovative uses of technology for education such as the Internet and Web-based instruction are a recent intellectual development in education.

In particular, teachers need to consider the use of the Internet and be familiar to use it in their daily lives not only to support their teaching but also to enhance and improve their own knowledge. It is through the use of the Internet that they can get abundant resources for their teaching as well as to get in touch with other teachers from other places, get recent developments and current issues of the English language teaching by joining some international professional organizations.

#### REFERENCES

- [1]. Al-Adi, F. (2007) Attitudes of Oman teachers of the English Language toward the use of the internet in their teaching and the factors contributing to their attitudes. Unpublished MA ICT & Education Dissertation. School of Education, University of Leeds.
- [2]. Al-Huneini, H. (2006). Training teachers to teach using computers in Ibra Basic Education Schools. Unpublished MA ICT & Education Dissertation. School of Education, University of Leeds.
- [3]. Alexiou-Ray, J.A., Wilson, E., Wright, V.H., & Peirano, A. (2003). Changing instructional practice: The impact of technology integration on students, parents, and school personnel. *Electronic Journal for the Integration of Technology in Education*, 2 (2), 58-80.
- [4]. Bell, F. (2005). Comprehension aids, internet technologies and the reading of authentic materials by adult second language learners. PhD Dissertation. Department of Modern Languages and Linguistics, Florida State University. Retrieved June 16<sup>th</sup> 2007 from <http://etd.lib.fsu.edu/theses/available/etd-04112005-152127/>.

- [5]. Bloch, J. (2007). Abdullah's blogging: A generation 1.5 student enters the blogosphere. *Language Learning and Technology*, 11 (2), 128-41.
- [6]. Bork, A. (2001). What is needed for effective learning on the internet? *Educational Technology and Society*, 4 (3), 139-44.
- [7]. Brandl, K. (2002). Integrating internet-based reading materials into the foreign language curriculum: From teacher-to student-centred approaches. *Language Learning and Technology*, 6 (3), 87-107.
- [8]. Brown, H.D. (2001). *Teaching by principles: An interactive approach to language pedagogy*. Beijing: Foreign Language Teaching and Research Press.
- [9]. Condie, R. & Livingston, K. (2007). Blending on-line learning with traditional approaches: Changing practices. *British Journal of Educational Technology*, 38 (2), 337-48.
- [10]. Coppola, E. (2004). *Powering up: Learning to teach well with technology*. New York: Teachers' College Press.
- [11]. Crystal, David. (2006). *Language and the Internet Second Edition*. Cambridge: Cambridge University Press.
- [12]. Davies, G. (2003). Perspectives on off-line and on-line training initiatives. In Felix, U. (Ed.). *Language learning on-line: Towards best practice*(pp.192-214). Lisse: Swets & Zeitlinger.
- [13]. de Freitas, S. (2007). Post-16 e-learning content production: A synthesis of the literature. *British Journal of Educational Technology*, 38 (2), 349-64.
- [14]. Dudeney, Gavin and Nicky Hockly. (2007). *How to Teach English with Technology*. Edinburgh Gate Harlow Essex: Pearson Education Limited.
- [15]. Dudeney, Gavin. (2007). *The Internet and the Language Classroom. Second Edition*. Cambridge: Cambridge University Press.
- [16]. Duggan, A., Hess, B., Morgan, D., Kim, S., & Wilson, K. (2001). Measuring students' attitudes toward educational use of the internet. *Journal of Educational Computing Research*, 25 (3), 267-81.
- [17]. ELCD (2001). *The new English curriculum for grades 5-10*. Muscat: Ministry of Education, Sultanate of Oman.
- [18]. Gibson, S. & Oberg, D. (2004). Visions and realities of internet use in schools: Canadian Perspectives. *British Journal of Educational Technology*, 35 (5) 569-85.
- [19]. Godwin-Jones, R. (2003). Optimising web course design for language learners. In Felix, U. (Ed.). *Language learning online: Towards best practice* (pp.43-56). Lisse: Swets & Zeitlinger.
- [20]. Gordon, D. (2003). Report on a consultancy visit to the English Language Curriculum Department. Muscat: Ministry of Education, Sultanate of Oman.
- [21]. González-Lloret, M. (2003). Designing task-based CALL to promote interaction: En busca de esmeraldas. *Language Learning and Technology*, 7 (1), 86-104.
- [22]. Graddol, D.(2000) "The future of English?", copyrights – The British Council, 1997, 2000.
- [23]. Greenfield, R. (2003). Collaborative e-mail exchange for teaching secondary ESL: A case study in Hong Kong. *Language Learning and Technology*, 7 (1), 46-70.
- [24]. Hampel, R., & Baber, E. (2003). Using internet-based audio-graphic and video conferencing for language teaching and learning. In Felix, U. (Ed.). *Language learning online: Towards best practice*(pp. 171-91). Lisse: Swets & Zeitlinger.
- [25]. Hill, J., Reeves, T., Grant, M., Han, S., & Wang, S. (2005). Learning in a wireless environment. The success and challenges of ubiquitous computing in a school. In Vrasidas, C., Vrasidas, G., & Glass, G.V. (Eds.). *Preparing teachers to teach with technology*. Greenwich: Information Age Publishing.
- [26]. Holec,H.(1981). *Autonomy and Foreign language learning*. Oxford: Pergamon.
- [27]. Hope, A. (2004). School internet use, youth and risk: A social-cultural study of the relation between staff views of on-line dangers and students' ages in UK schools. *British Educational Research Journal*, 32 (2), 307-29.
- [28]. Hsu, Y., Cheng, Y., & Chiou, G. (2003). Internet use in a senior high school: A case study. *Innovations in Education and Teaching International*, 40 (4), 356-68.
- [29]. Hubley, N. (2006) Final report: English curriculum framework for grades 11 and 12 after basic education. Muscat: Ministry of Education, Sultanate of Oman.