A Genre-based Approach to Computer-Assisted Language Learning

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Abstract

Learning English as a second language is a great challenge for students from a non-English background. It is not the natural language acquisition seen in first language learning. Learners have to depend on various learning resources to ensure success. These resources include interacting with native English speakers, effective teaching methods, appropriate technology and the ability of the learners to manage their learning. The development of genre theory (eg. Christie, 1990; Martin, 1990; Hasan) has made a great contribution to language and literacy education, particularly in Australia. This is an interventionist approach to literacy education. Literacy learning is not always an effortless process, but it can be an up-hill battle for many learners. Genre is seen as the way culture carries out its transactions and communication. Knowledge is conveyed through different genres determined by culture. However, though the application of research on genre analysis and development has recently made a positive impact on the ESL (English as a Second Language) field, the application of genre theory on computer assisted learning for ESL students is still at a preliminary stage. This paper will critically examine the educational link between genre analysis and computer assisted learning and on this basis it will explore ways of developing software that is based on genre analysis to help ESL students learn scientific genres. It will enhance the learning of academic English, particularly scientific genres, by non-English speaking background students. For many ESL students in particular, and all tertiary students in general, the language of science is an essential aspect of understanding science.

Keywords

genre, ESL, scientific English, multimedia

1. Computer Technology and CALL

Learning English as a second language is a great challenge for students from a non-English speaking background. It is not the natural language acquisition seen in first language learning. Learners have to depend on various learning resources to ensure success. These resources include interacting with native English speakers, effective teaching methods, appropriate technology and the ability of the learners to manage their learning. Computer technology has permeated society in general and education in particular. While computer technology has created an impact in education, the debate on its role in teaching and learning has not settled comfortably. Anderson (1991, p. 25) gives the following advice or warning: 'technology is changing so quickly, it is our task as administrators or teachers to be aware of the waves, to look critically at them and judge how effective are these tools for teaching and learning'. Commercially-based companies with their powerful resources have continually produced educational software and it is important for educators to examine critically the educational background and principles underlying the production and use of such software. Taylor

learning) program in schools lies in the way in which computers are introduced to teachers and how they introduce and use computers with their students. What Taylor implies is that CALL software should be consistent with the current belief and practice of the teacher about teaching and learning.

2. Hallidayan Perspective

Though the name 'Halliday' needs no introduction to students of linguistics, it is the opposite in the field of computer science. Halliday's great influence on language education in Great Britain and Australia is unquestionable. His view on the nature of language and language learning is particularly attractive to those who are practically oriented, in the sense that they search for a theory of language that can function for them. For Halliday, children learn language because they realise what language can do for them. Language educators have witnessed the emergence and disappearance of language theories in linguistics and their impacts on language education such as Generative Transformational Grammar, Case Grammar, Generative Semantics, Tagmemics. However, Halliday's Functional Grammar (1985) has definitely occupied a special place both in theory and practice in language education recently. Firebaugh (1988, p. 214) points out that by adding the pragmatics of context of language in Halliday's grammar, the meaning potential becomes much clearer and much ambiguity is removed. Due to the fact that Halliday' s model emphasises the functional context of language in terms of ideational, interpersonal and textual functions, he has given the field of artificial intelligence a powerful tool to deal with research on natural language processing.

Another aspect of Halliday's contribution to applied computing is his view on the vital link between language and learning, which consists of learning language, learning about language, and learning through language. The intricate relationship between language and learning presented by Halliday has become a useful compass for curriculum design in general and language teaching syllabii in particular. As Halliday is interested primarily in the function of language in social context, genre has become an obvious target for linguistic investigation as it is socially determined. Halliday (1993) examines the characteristics of scientific English and provides the following aspects that are grammatically motivated and are potential problems for learners: interlocking definitions, technical taxonomies, special expressions, lexical density, syntactic ambiguity, grammatical metaphor, and semantic discontinuity. These characteristics will be included in the discussion of the multimedia package later in this paper.

3. ESL Students and their Scientific Genre Struggle

The development of genre theory under the influence of Halliday has been taken seriously by language educators. This is an interventionist approach to literacy education. Literacy learning is not always an effortless process, but it can be an up-hill battle for many learners. Genre is seen as the way culture carries out its transaction and communication. Knowledge is conveyed through different genres determined by culture. Genres can be seen as cultural 'procedures' used appropriately according to communicative goals, such as narrative, report, recount, explanation, argument etc. Genre competence is an essential part of communicative competence.

Teachers should be aware of the demand society makes on the use of genres in different social contexts and interactions. In addition, genre is essential in education as each subject has its own genres. For instance, scientific genre is the way scientific knowledge is expressed. Learning scientific genre is therefore learning about science. As Martin (1990, p. 100) states:

> A necessary part of becoming a proficient science student is learning to read and write the various genres particular to science fields, and for that reason teachers need to think carefully about the genres they want their students to learn.

It is often assumed that ESL students' main difficulty in learning English as a second language is confined to vocabulary, pronunciation, grammar and sociolinguistic competence. This is true with beginning and intermediate learners. For international students, whose English achievement is above the normal English requirement, the struggle with English has not ended yet. Science students still face what I refer to as 'the scientific genre struggle'. There are probably two main reasons for this. Firstly, their TESOL (Teaching English to Speakers of Other Languages) was heavily based on the acquisition of vocabulary and English grammar. Secondly, they were not taught scientific genres at home. The common strategies used by these students to overcome 'the scientific genre struggle' in their tertiary education in Australia are to paraphrase or slightly modify texts from publications and to ask English-speaking persons to help with writing .

4. A Genre-based Multimedia Package

As previously pointed out, for many overseas students studying in an English-speaking institution, the success or failure in education depends crucially on their English competence, particularly in dealing with academic genres. With a big increase of international students, English-based tertiary institutions have started to examine their teaching and learning environments to cater more effectively for them. Support in English competence is needed urgently as educational failure is, to most international students, the result of failure in tackling the demands of academic English, particularly, academic writing such as essays, reports, dissertations, and theses. Recent CAUT grants indicate the recognition of the role of computer technology in assisting students with academic writing. For example, Vance (CAUT grant,1995) tackled academic writing problems by integrating professional and academic writing skills in the computing curriculum. Similarly, Tchirato (CAUT grant, 1995) introduced the Communicore resource kit. This is an important step in involving technology-oriented staff in literacy development. Candlin (CAUT grant,1995) developed teaching materials to help economics and accounting students master academic English. In the commercial world, interest in CALL seems endless. Various programs including CALL software packages have been produced to cope with the enormous demand but they tend to focus on technical aspect of production and do not reflect significant insights gained from current research on genre-based approach in language education, which has had a strong impact on language and literacy education in Australia.

As pointed out at the beginning of this paper, the application of research on genre analysis and development has recently made some positive impact on language and literacy education and TESOL, the application of genre theory on computer assisted learning for ESL students is still in its embryonic stage. It is important to examine the educational link between genre analysis and computer assisted learning and on this basis to develop a multimedia package for ESL students to learn scientific genres.

The project aims at offering ESL students an innovative multimedia package encompassing the insights gained from past and present activities and current research on academic genres. In particular, it focuses on three common scientific genres, namely reports, explanations and experiments. The multimedia package includes three main scientific genres described by Martin (1990) as follows.

> a. Report genre: According to Martin, report is a major genre in science textbooks. The main function of a report is to organise information about things, typically by classifying them or decomposing them. Reports have distinctive linguistic features such as (1) generic participants (eg. plants, animals, ecosytems); (2) timeless verbs in simple present tense; and (3) a large percentage of *being* and *having* clauses.

> b. Explanation genre: Martin notes that textbooks can be seen as large reports made up of a series of smaller ones. When the smaller reports focus on

processes, either to classify them or to use them as criteria for classifying things, the explanation genre is used.

c. Experiment genre: Experiment genre, unlike report and explanation, has a very clear staging structure, which is functional. eg. aim, method, result, conclusion.

Apart from the focus on these three main scientific genres, the multimedia package includes a general discussion on the grammatical aspects of scientific genres described by Halliday (1993). These aspects are important for ESL students, and should also be noted by science teachers, as they can cause problems for the students in tackling scientific English. They are: interlocking definitions, technical taxonomies, special expressions, lexical density, syntactic ambiguity, grammatical metaphor, and semantic discontinuity.

The multimedia software includes the following modules:

- Module A: General aspects of scientific English (kiosk-based presentation).

- Module B: Scientific genres (kiosk-based presentation).

- Module C: Practical lessons on scientific genres (tutorial pathways).

- Module D: Resources on scientific genres eg. glossary, publications (kiosk-based presentation).

The package uses Hypercard 2.2 and Photoshop.

5. Conclusion

For many ESL students in particular, and all tertiary students in general, the language of science is an essential aspect of understanding science. The problems facing ESL learners and others in understanding and using the language of science are not confined to scientific words or jargons but also include structural complexity, scientific discourse organisation and illustration. The multimedia CALL package is aimed at enhancing the learning of scientific English, particularly scientific genres, by students, from a non-English speaking background and attending science courses in Australia, who are faced with the difficulty of scientific English. The main feature of this multimedia package lies in the incorporation of audio-visual media into a program that provides learners with various alternatives and interactions during the learning process.

6. References

Anderson, J. (1991). Computer-based technologies: effective tools for teaching and learning. In T. Lê and M. McCausland (Eds.), *Language education: Interaction and development. Proceedings of the International Conference on Language Education: Interaction and Development*. University of Tasmania.

CAUT grants 1995, DEET, Australia.

Christie, F. (Ed.). (1990). *Literacy for a changing world*. Victoria: Australian Council for Educational Research.

Firebaugh, M. W. (1988). *Artificial intelligence: A knowledge-based approach*. Boston: PWS-Kent.

Halliday, M. A. K. (1985). *An introduction to functional grammar.* London: Edward Arnold.

Halliday, M. A. K. (1993). On the language of physical science. In M.A.K Halliday and J.R. Martin (Eds.), *Writing Science*. Bristol: The Falmer Press.

Martin, J. R. (1990). Literacy in science. In F. Christie (Ed.), *Literacy for a changing world*. Victoria: Australian Council for Educational Research.

Taylor, G. (1991). Developing a CALL program. In T. Lê and M. McCausland (Eds.), *Language education: Interaction and development. Proceedings of the International Conference on Language Education: Interaction and Development*. University of Tasmania.