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‘Life Buoy’: The Effects of Computer-Based Multimedia Software on the Receptive Lexical Knowledge of ESP Students

Kourtina Grammati

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'*Life Buoy*': The Effects of Computer-Based Multimedia Software on the Receptive Lexical Knowledge of ESP Students

Grammati Kourtina, MA
Teacher of English, IEK
Volos, Greece
mkourtina@hotmail.com

SUMMARY

In the last decade high technology, notably in the form of computers, has established a powerful presence in foreign language pedagogy. Some common justifications for the use of multimedia and computers in language learning and teaching are that they are said to bring the real world into the classroom, mainly through digitised video, and illustrate more accurately certain features, processes and terms than by other means; create learning environments that trigger enhanced levels of motivation; and allow the learners to proceed individually in the learning procedure through experiencing at their own pace during a broad time period not fixed by a regular class schedule.

Under these perspectives this paper proposes the "Life Buoy", a model piece of software appropriate for learning receptive, Marine English vocabulary in a computer-based multimedia learning environment. The model was specifically designed and produced by the researcher to suit the purposes of the study, and tested on a number of subjects to evaluate its effectiveness. The author contends that the success of the experiment in terms of vocabulary learning gains suggests a very promising educational value for computer-based multimedia language-learning environments, which in turn entails their potential effective utilization in ESP learning environments.

KEY WORDS: *ESP, CALL, Multimedia Learning Environments, Vocabulary Learning*

INTRODUCTION

The constant progress in information and communications technology nowadays necessitates the use of modern educational technological support by foreign language (FL) learners. Devices, which in the past seemed to be impossible to implement into the FL learning procedure, in the present gradually replace traditional learning equipment. However, this is not to say that former educational means will be totally replaced in light of the modern ones. On the contrary, traditional FL learning modes can be supplemented and augmented by new technology, and it is for FL teachers to ascertain its potential and explore the most productive ways to employ it to facilitate and boost FL learning (Brett, 2000). This paper forms a proposal – both on a theoretical and practical level- of the way that computers and digitised video can be effectively implemented in an English-for-Marine Technology-Purposes learning environment.

LITERATURE REVIEW

ENGLISH FOR SPECIFIC PURPOSES (ESP)

In recent years, the term 'language for specific purposes' (LSP) has been emerging more regularly in the literature referring to English language teaching and learning than in the past. It is, in the main, used to relate to the teaching and learning of English for a plainly utilitarian purpose (Mackay & Mountford, 1978:2, McDonough, 1984: 5). To be more concrete, English for Specific Purposes (ESP) views language as being in the service of other subjects or spheres of life. One may say that ESP belongs more appropriately to the communicative approach –the two developed alongside one another- since it is determined in all essentials by the communication needs of the learners. Languages for specific purposes are never used in a vacuum but are necessarily bound to a communicative context, that in which the LSP learners are engaged in their academic or occupational environment (instructional /operational language) (Strevens, 1988). So, almost by definition ESP is language in specific context and for specific use.

There are a great many different kinds of ESP and the methods and materials in use for a particular kind of ESP must be appropriate and direct to that kind. For example, in the field of English for Science and Technology (EST), which will be of our main concern in this study, one may expect that courses for practicing and/or professional technologists be more media and materials oriented, and focus mainly on practicing the receptive skills (i.e. listening, reading) and the passive aspects of language (i.e. vocabulary, structure) (Robinson, 1980: 63).

Despite the variety in the kinds of ESP, in all cases the real keys to language acquisition are the catering for the learners' communication needs, which guarantees increased levels of motivation (Tacheva, 1994), and the provision of authentic, content-based contexts within which the learners can practice their skills in the target language.

MULTIMEDIA LEARNING ENVIRONMENTS

Under this perspective, the emergence of multimedia over the past twenty years or so with the most current advance in digital technologies holds notable implications for ESP learning and teaching. Computer-based multimedia has the capacity to deliver contextualized fragments of specific language to the ESP learning environment by juxtaposing and integrating the traditional media of language learning, such as video, pictures, sound, and text (Brett, 2000). ESP learners are exposed in this way to the target situations they will come across in their future academic or occupational lives.

The computer, on one hand, is a basic requirement for language courses nowadays due to its novel and innovative features: the flexibility in handling information quickly and directly (i.e. it enables multiple scannings through in-links with the software and outlinks with the Internet), the ability to carry out interactive tasks at a faster speed, the catering for experiential learning (i.e. learn by doing) and enhanced language and computer literacy, the provision of learning facilities (e.g. record keeping, automatic scoring, email feedback, per cent to pass, information databases, glossaries, transcripts) (Hardisty & Windeatt, 1989; Allan, 1990; Stevens, 1991; Augustynczyk, 2000; Lee, 2000; Koren, 2001). The digitised video, on the other, also makes a substantial contribution to language learning: it adds a moving visual element to sound and presents both the verbal and non-verbal aspects of language in a more lively and meaningful way than other media; it presents the target language in action by bringing the outside world into the classroom; it captivates attention and does not allow hearing and sight to rest due to the power of screen; it creates feelings of entertainment which keep learners contented whether they are leaning or not (Kennedy, 1983; Willis, 1983; Lonergan, 1984: 4-5; Hill, 1989: 3-4; Stempleski & Tomalin, 1990: 3-4, Tomalin, 1990: 4-5).

Most recent studies (Watts, 1997; Rico & Vinagre, 2000; Al-Seghayer, 2001; Fernández, 2001) have shown that some basic premises for effective foreign language (FL) learning -and ESP

learning in consequence- such as authenticity of materials, appropriateness and relevance to the learners' needs and objectives, increased motivational power, multi-skill practice, subject-based interactive activities, opportunities for self-instruction and learner-centred learning, and non-linear access to a vast amount of subject-specific information can be fully satisfied within the innovative computer- and video-based multimedia settings. The same studies also indicate more effective language comprehension and recall while using multimedia than other media, which holds important implications for ESP learning.

VOCABULARY LEARNING IN ESP

Within such contextualized environments (multimedia or real ones), specialized vocabulary plays a key role. Vocabulary is the passport to a language, whether native or non-native, and good command of a specialized vocabulary is certainly the passport to ESP. In general, mastery of a lexical item involves among others to recognise both its sound and written form, recall it at will, link it to an appropriate concept or object in the real world, and know its equivalent in the mother tongue (Wallace, 1982: 27; McCarthy, 1990; Taylor, 1990:1-4; Carter, 1998:191). Respectively, mastery of special lexis requires the same skills and seems to be less of a problem to ESP learners than it may appear to English language learners in general. The ESP learners have already acquired a conceptual framework, their subject content, into which new terminology fits relatively easily (Strevens, 1973, Robinson, 1991). Even so, the issue of lexical difficulties faced by ESP learners is still considered to be one of the most important issues in ESP learning theories.

When deciding on the words that are to be taught in an ESP lesson the material designer may need to take into consideration certain criteria that correspond with the learners' lexical needs, academic and/or occupational interests, educational language learning background, age, and language proficiency (Allen, 1983:108). Additionally, in certain cases of ESP learning, as it is for example in EST courses, what is of most interest to the learners is the receptive acquisition of specialized words, i.e. to gain the ability to recognise and comprehend them in the context of listening and reading material, such as academic lectures or scientific journals.

Past and present studies (Henning, 1973; Ott *et al*, 1973; Ladd, 1977; Clarke & Nation, 1980; Cohen & Aphek, 1980; Lin & Nation, 1985; Kang, 1995; Laufer & Paribakht, 1998; Rodríguez & Sadoski, 2000; Al-Seghayer, 2001) on the effect of context, audio-visual aids, image modalities, associations and other mnemonic-based learning methods on the learning and retention of FL vocabulary as well as theories on the factors that may relate to effective learning of FL vocabulary (Gairns & Redman, 1986:58; McCarthy, 1990:86; Nation, 1990:21) have clearly indicated that learning lexical items in context and/or by means of audio-visual support fosters the necessary skills for lexical mastery mentioned above and produces superior recall than any other FL vocabulary method. This suggests a very promising educational value for these methods, which in turn entails their potential effective exploitation in ESP learning environments (as the one proposed in this paper).

THE STUDY

In an effort to produce a model piece of ESP computer-assisted language learning (CALL) software and trace teaching modes alternative to the traditional ones to enhance ESP vocabulary learning, the present study examined the relative effectiveness of a computer-based multimedia Marine English CD-ROM ("*Life Buoy*") on the receptive specialized lexis of students of Marine Technology. The research was carried out at the University of Newcastle, UK on five students, who met the requirements that the researcher had set for the programme's intended audience (both primary and secondary).

The "*Life Buoy*" was specifically designed and developed by the researcher according to the guidelines for designing multimedia learning environments (O'Donnell, 1990; Hemard, 1997; Watts, 1997), ESP material (Fortune, 1977; Riddel, 1991, Pilbeam 1987), and FL vocabulary

learning courses (Clarke & Nation, 1980; Nation, 1980; Wallace, 1982:27-35; Burling, 1983; McCarthy, 1990: 108; Goodfellow, 1993; Goodfellow, 1995; Schmitt, 1997; Carter, 1998: 203; Nelson, 1998). This literature forms the stepping-stone for the design of the particular CALL programme and the conduct of the experiment. For producing the software the researcher used a high quality Hi8 video camera, *Macromedia Authorware 5*, *Adobe Premiere 5.0* for processing the video and audio extracts ,and *Jasc Paintshop Pro 6* for processing the still frames and pictures.

The "*Life Buoy*", as its name implies, was basically meant to assist marine technology students that are instructed in English (as a FL) to recognise, comprehend and retain a set amount of specialized lexis in the context of video, audio, text and pictorial material. In other words, it was planned to develop the learners' receptive vocabulary knowledge within a multimedia setting. The incentive for producing such software was to help Greek (and other overseas) students of marine technology at English or English-speaking universities to grasp and enhance the marine-related lexis with which they are confronted on a daily basis so as to respond successfully to the demands of their academic course. In addition, at the time the research was carried out there was an inadequate pool in the shops and on the Web of suitable material, which was designed to specifically meet the needs of these particular learners. Therefore, the "*Life Buoy*" was expected to be innovative within its field.

The researcher set two hypotheses to guide her experiment: does the multimedia setting augment the receptive knowledge of the target words? Does it contribute to the retention of these words after a particular lapse of time? By exploiting authentic audio and video extracts (published and custom-made) as well as a number of illustrations -all related to marine technology topics- the specific CALL programme engaged the students in a variety of interactive, marine-content activities and provided them with a number of extra vocabulary learning facilities (glossary, pop-up definitions, transcript, translation to L1, quizzes, final test, scores, links to on-line help). Appendix 3 presents a couple of sample screens of the *Life Buoy*.

After having repeatedly presented the subjects with the target words in multiple, meaningful contexts the researcher utilised three broad experimental instruments to evaluate the effectiveness of that presentation and reach conclusions about the overall effect of the "*Life Buoy*" on the subjects' receptive lexical knowledge: a paper-and-pencil vocabulary test was administered at three different times (pre-task test, post-task test 1, post-task test 2), activities scores and time needed for the completion of the programme were recorded, and a face-to-face interview was conducted. To ensure the validity and reliability of the results the researcher used T-tests and one-way ANOVA comparisons in the *Mini-tab* statistical software. The statistical contrastive analysis of the test scores (Appendix 1) in parallel with the subjects' scores in the programme's activities (Appendix 2) and the information provided by the face-to-face interviews indicated that there was indeed a rising difference in the number of specialized words known (receptively) by the subjects. This difference is most likely to be due to the presentation modes that the CALL programme makes use of. The video, audio, text and pictorial material together with the supplementary learning facilities incorporated in the software seem to have had such an impact on the subjects' perception that gradually increased their Marine English lexical receptive knowledge to a notable extent. Not only that but the programme seems to have also affected the subjects' retention of the target words, since, five days after its completion, they all scored (in post-task test 2) almost as high as in the post-task 1 [1]. In addition, the software can be judged as an effective vocabulary-learning tool because it has yielded positive impressions on the subjects' behalf: all of them acknowledged its value and helpfulness. On the whole, the results (subjects' scores and reports) indicate that the overall aim of this study was successfully met.

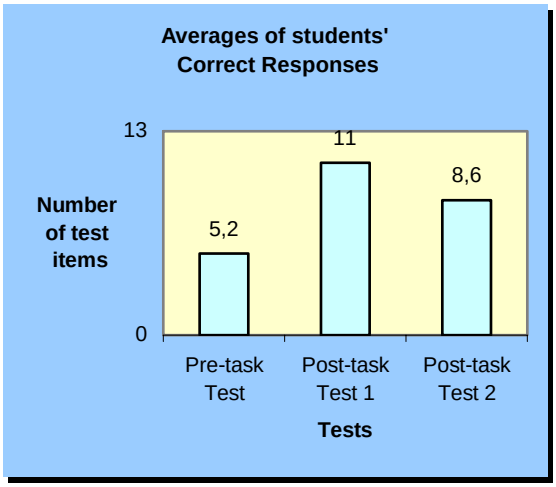
CONCLUSION

It was hoped that using the "*Life Buoy*" with its contextual support, guided activities, and learning facilities might have contributed to the expansion of the subjects' Marine English lexical

receptive knowledge, and their scores and reports suggest that this has been achieved. Thereupon, the findings of the present research support previous studies into computer–assisted FL learning, which indicate that computer-based multimedia provide a fruitful environment for FL learning in general, and specialized vocabulary learning in more specific.

APPENDIX 1

Chart 1 Average number of words known in each test



The statistical treatment of the above test scores gave the following information:

(1) Pre-task test with Post-task test 1 (Table 1):
T-Value = -4.06
P-Value = 0.005 < 0.05, thus the results are statistically significant
DF [2] = 7
Mean Difference [3] = -5.80

Table 1: Results of pre-task test with post-task test 1 using *t-test*

	N [4]	Mean	StDev [5]
Pre-task	5	5.20	2.59
Post-task 1	5	11.00	1.87

(2) Pre-task test with Post-task test 2 (Table 2):
T-Value = -2.47
P-Value = 0.049 < 0.05, thus the results are still statistically significant
DF= 6
Mean Difference = -3.40

Table 2: Results of pre-task test with post-task test 2 using *t-test*

	N	Mean	StDev
Pre-task	5	5.20	2.59
Post-task 2	5	8.60	1.67

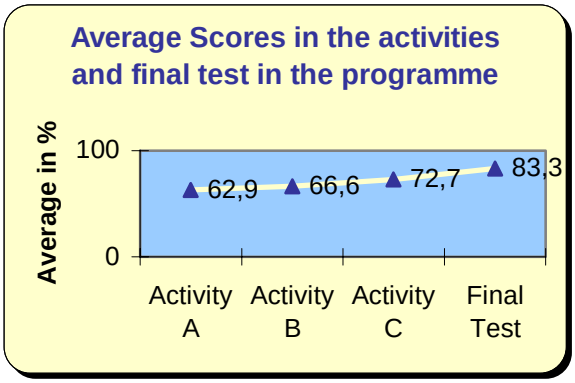
(3) Post-task test 1 with Post-task test 2 (Table 3):
T-Value = 2.17
P-Value = 0.07 > 0.05, thus the results are statistically insignificant
DF= 7
Mean Difference = 2.40

Table 3: Results of post-task test 1 with post-task test 2 using *t-test*

	N	Mean	StDev
Post-task 1	5	11.00	1.87
Post-task 2	5	8.60	1.67

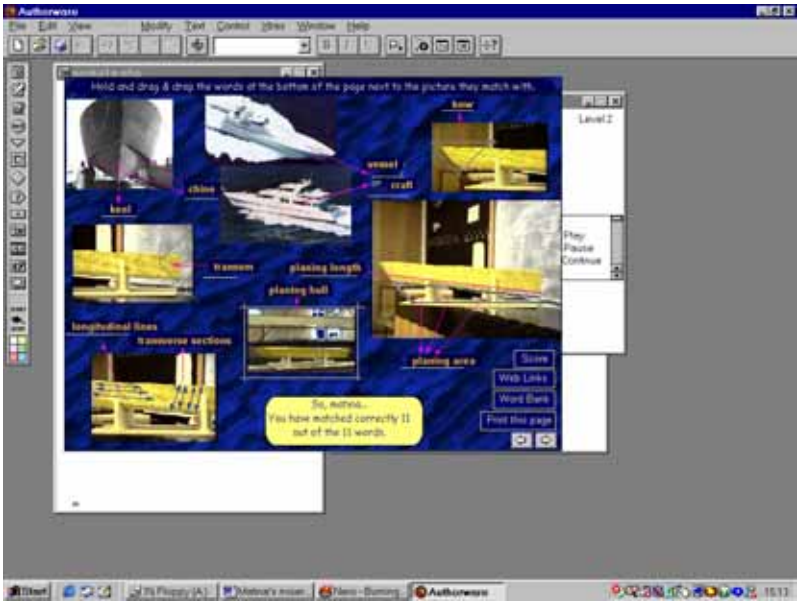
APPENDIX 2

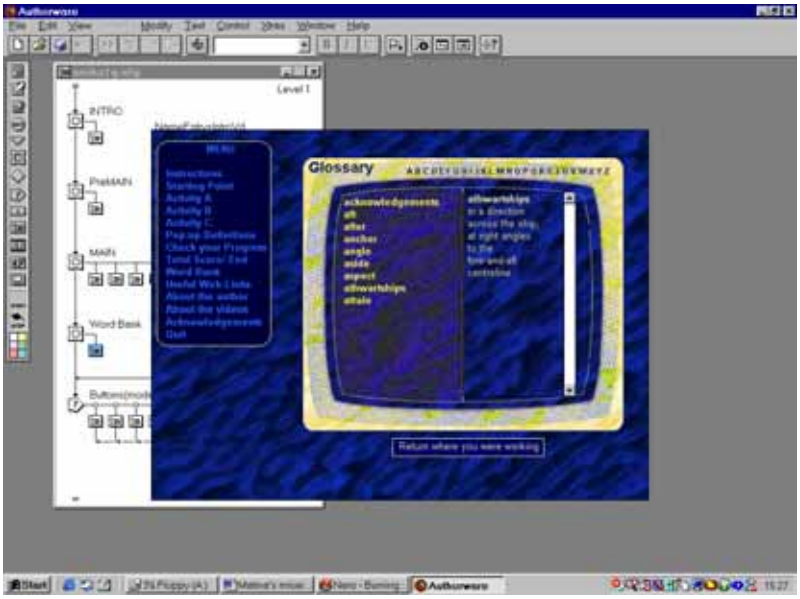
Chart 2 Subjects' scores in the activities of the programme



APPENDIX 3

Sample screens of the programme





NOTES

[1] Nevertheless, when the scores in post-task test 2 were statistically compared with those in post-task test 1 they did not give statistically significant results, which may mean that the difference in scores may be random and not due to the CALL programme.

[2] The ***DF*** is the degree of freedom, which should be one less than the number of subjects. In this research, the DF in all comparisons should be 4. The statistical analysis of the scores, however, gave different DF from the expected ones, which may require further investigation from a professional statistician (Jones, personal communication). In any case, the data were double-checked with *one-way ANOVA* as well, which gave the same results as *t-tests*. Thus, their validity was confirmed.

[3] ***Mean Difference*** is the difference in mean scores.

[4] ***N*** is the number of subjects.

[5] ***Standard Deviation (StDev***) shows whether the subjects' scores are closely bunched together (a small St Dev) or widely scattered (a large StDev), i.e. it shows 'typical variation'

REFERENCES

Allan, J. (1990) 'Evaluating CALL'. *Language Learning*, Vol. 2, pp. 73-74.

Allen, V. F. (1983) *Techniques in Teaching Vocabulary*. New York: Oxford University Press.

Al-Seghayer, K. (2001) 'The Effect of Multimedia Annotation Modes on L2 Vocabulary Acquisition: A Comparative Study'. *Language Learning & Technology*, Vol.5, No.1, pp.202-232.

Augustynczyk, E. (2000) *Using Video and Computers in Teaching and Learning Vocabulary*. Retrieved March 20, 2001 from World Wide Web: http://www.Cksr.ac.bialystok.pl/flattic/ewaaroz/ewaaug.html

Brett, P. (2000) 'Integrating Multimedia into the Business English curriculum: a case study'. *English For Specific Purposes*, Vol.19, pp. 269-290.

Burling, R. (1983) 'A proposal for Computer-Assisted Instruction in Vocabulary'. SYSTEM, Vol. 11, No. 2, pp.181-190.

Carter, R. (1998) *Vocabulary: Applied Linguistic Perspectives, 2nd edition*. London & New York: Routledge.

Cohen, A. & E. Aphek (1980) 'Retention of Second Language Vocabulary over time'. *SYSTEM*, Vol.8, pp. 221-235.

Clarke, D.F. & I.S.P. Nation (1980) 'Guessing the meaning of words from context: strategy & techniques'. *SYSTEM*, Vol. 8, pp. 211-220.

Fernández, M.V. (2001) 'The EFL Teacher and the Introduction of Multimedia in the classroom'. *Computer Assisted Language Learning*, Vol. 14, No. 1, pp. 3-14.

Fortune, A. (1977) 'Making courses in science and technology more relevant to the needs of the student'. In Holden, S. (ed.) *English for Specific Purposes*. Grimsby: Modern English Publications.

Gairns, R. & S. Redman (1986) *Working with words: a guide to learning and teaching vocabulary*. Cambridge: CUP.

Goodfellow, R. (1993) 'CALL for Vocabulary: Requirements, Theory & Design'. *Computer Assisted Language Learning*, Vol. 6 (2), pp. 123-144.

Goodfellow, R. (1995) 'A Review of the Types of CALL Programs for Vocabulary Instruction'. *Computer Assisted Language Learning*, Vol. 8, No. 2-3, pp. 205-226.

Hardisty D. & S. Windeatt (1989) *CALL*. Oxford: Oxford University Press.

Hemard, D. P. (1997) 'Design Principles and Guidelines for Authoring Hypermedia Language Learning Applications. *SYSTEM*, Vol. 25, No. 1, pp. 9-27.

Henning, G. H. (1973) 'Remembering foreign language vocabulary: acoustic and semantic parameters'. *Language Learning*, Vol. 23, No. 2, pp. 185-195.

Hill, B. (1989) *Technology in Language Learning: Making the Most of Video*. London: CILT.

Kang, S. (1995) 'The effects of a Context-Embedded Approach to Second Language Vocabulary Learning'. *SYSTEM*, Vol. 23, No. 1, pp. 43-55.

Kennedy, C. (1983) 'Video in English for Specific Purposes'. In McGovern, J. (ed.) *ELT Documents: 114, Video Applications in English Language Teaching*. Oxford: Pergamon Press & the British Council.

Koren, S. (2001) *Vocabulary Instruction through Hypertext: Are there Advantages Over Conventional Methods of Teaching*. Retrieved May 4, 2001 from World Wide Web: http://www.zait.uni~bremen.de/wwwgast/tesl_ej/ej13/a2html

Ladd, M. (1977) 'Audio-visual vocabulary building'. *Proceedings of the Pacific North West Conference on Foreign Languages*, Vol. XXVIII, No. 2, pp. 88-89.

Laufer, B. & T. S. Paribakht (1998) 'The Relationship Between Passive and Active Vocabularies: Effects of Language Learning Context'. *Language Learning*, Vol. 48, No. 3, pp. 365-391.

Lee, K. (2000) 'English Teachers' Barriers to the Use of Computer-assisted Language Learning'. *The Internet TESL Journal*, Vol. VI, No. 12. Retrieved May 19, 2001 from World Wide Web: http://iteslj.org/Articles/Lee-CALLbarriers.html

Lin, N. A. & I. S. P. Nation (1985) 'Factors affecting guessing vocabulary in context'. *SYSTEM*, Vol. 16, No. 1, pp. 33-42.
Lonergan, J. (1984) *Video in Language Teaching*. Cambridge: CUP.
Mackay, R. & A. J. Mountford (1978) (eds.) *English for Specific Purposes*. London: Longman.
McCarthy, M. (1990) *Vocabulary*. Oxford: Oxford University Press.
McDonough, J. (1984) *ESP in Perspective: a practical guide*. London & Glasgow: Collins ELT.
Nation, I. S. P. (1980) 'Strategies for Receptive Vocabulary Learning'. *Guidelines*. Vol. 3, pp. 18-23.
Nation, I. S. P. (1990) *Teaching and Learning Vocabulary*. New York: Newbury House.
Nelson, B. (1998) 'Web-Based Vocabulary Activities: Pedagogy and Practice'. *Computer Assisted Language Learning*, Vol.11, No.4, pp. 427-435.
O' Donnel, H. (1990) 'Negotiating CALL Software Design'. *Language Learning*, Vol. 1, pp. 55-57.
Ott, C. E., D. C. Butler, R.S.Blake, & J. P. Ball (1973) 'The effects of interactive-image elaboration on the acquisition of foreign language vocabulary'. *Language Learning*, Vol. 23, No.2, pp.197-206.
Pilbeam, A. (1987) 'Can Published Materials be Widely used for ESP Courses?' In Sheldon, L. E. (ed.) *ELT Documents: 126, ELT Textbooks and Materials: Problems in Evaluation and Development*. London: Modern English Publications & the British Council.
Rico, M. & F. Vinagre (2000) 'A Comparative Study in Motivation and Learning through Print-Oriented and Computer-Oriented Tests'. *Computer Assisted Language Learning*, Vol.13, No.4-5, pp. 457-465.
Riddel, P. G. (1991) 'Analysing student needs in designing specific-purposes language syllabuses'. *Language Learning*, Vol.3, pp.73-77.
Robinson, P. (1980) *ESP (English for Specific Purposes*). Oxford: Pergamon Press.
Robinson, P. (1991) *ESP today: a practitioner's guide*. London: Prentice Hall.
Rodriguez, M. & M. Sadoski (2000) 'Effects of Rote, Context, Keyword, and Context/Keyword Methods on Retention of Vocabulary in EFL Classrooms'. *Language Learning*, Vol. 50, No. 2, pp.384-412.
Schmitt, N. (1997) 'Vocabulary Learning Strategies'. In Schmitt, N. & M. McCarthy (eds.) *Vocabulary: Description, Acquisition and Pedagogy*. Cambridge: CUP.
Stempleski, S. & B. Tomalin (1990) *Video in Action: Recipes for using Video in Language Teaching.* London: Prentice Hall.
Stevens, V. (1991) 'A study of attitudes toward CALL in a self-access student resource centre' *SYSTEM*, Vol. 19, No. 3, pp. 289-299.
Strevens, P. (1973) 'Technical, Technological, and Scientific English (TTSE)'. *English Language Teaching Journal*, Vol.27, No. 3, pp. 223-233.
Strevens, P. (1988) 'The Learner and Teacher of ESP'. In Chamberlain D. & Baumgardner R. J. (eds.) *ELT Documents: 128, ESP in the classroom: Practice and Evaluation.* Oxford: Modern English Publications & the British Council.
Tacheva, V. (1994) 'Factors for positive emotional motivation in learning and testing foreign language for specific purposes'. In Scott, W. & S. Muhlhaus S. (eds.) *Languages for Specific Purposes*. Surrey: CILT & Kingston University School of Languages.
Taylor, L. (1990) *Teaching and Learning Vocabulary*. New York: Prentice Hall.
Tomalin, B. (1990) *Video in the English Class: Techniques for successful Teaching*. London: BBC English.
Wallace, M. (1982) *Teaching Vocabulary*. London: Heinemann Educational Books.
Watts, N. (1997) 'A Learner-based Design Model for Interactive Multimedia Language Learning Packages'. *SYSTEM*, Vol. 25, No.1, pp. 1-8.
Willis, D. (1983) 'The Potential and Limitations of Video'. In McGovern, J. (ed.) *ELT Documents: 114, Video Applications in English Language Teaching*. Oxford: Pergamon Press & the British Council.