

# The Efficacy of Computer-Activated Tasks (CATs) for Teaching E-Literacy in the ESOL Context

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## Abstract

This paper introduces Computer-Activated Tasks (CATs), a type of task the author designs for teaching e-literacy as means of solving the problem of 'digital divide'. It also justifies their use in the ESOL/ESL context and describes a method of evaluating CATs through measuring their Language Learning Potential (LLP). For this, the author employs Chapelle's (2001) framework for evaluating Computer Assisted Language Learning (CALL) activities and Skehan's (1998) cognitive approach to Task-Based Instruction.

The author's empirical study presented here is supported by a small-scale but longitudinal research in intact *ESOL+ICT* classes. The research reveals that the CAT key feature - the interplay between its language and ICT structural components - beneficially affects CAT LLP and promotes acquisition of e-literacy. The latter is viewed as a convergence of computer skills with traditional and other types of literacy within the *pedagogy of multiliteracies*. The CAT LLP is operationalised through measuring accuracy and complexity of learner output during CAT performance and the results of e-literacy and English proficiency exams in the experimental and control groups. The study provides some evidence that, alongside teaching ICT skills, CATs are efficacious for improving oral as well as written performance of ESOL/ESL learners at the elementary as well as at the intermediate level, which could be applied for teaching e-literacy in a variety of contexts.

## Keywords

<b>CALL:</b>	Computer Assisted Language Learning
<b>CAT:</b>	Computer-Activated Task – a task for teaching e-literacy
<b>ESOL/ESL:</b>	English for Speakers of Other Languages (UK)/ English as a Second Language (USA)
<b>FonF:</b>	Focus on Form
<b>Interplay:</b>	CAT key characteristic, interaction between CAT content components – English & ICT
<b>LLP:</b>	Language Learning Potential
<b>TBI:</b>	Task-Based Instruction

## Introduction

The focus of this paper is electronic literacy from a pedagogic perspective. The author presents a method of teaching e-literacy in the ESOL/ESL context by using *CATs*, *Computer-Activated Tasks*. It is a new type of task the author designs for teaching English with Information and Communication Technology to adult learners whose first language is not English and who need to combine learning English with acquiring basic computer skills.

This paper reports on a theoretical study and a practitioner-led small-scale research in intact classes during one academic year. The goal of the theoretical study is to introduce CATs and justify their use for teaching e-literacy. The research combines qualitative and quantitative methods and evaluates CAT *Language Learning Potential* (LLP). The evaluation is implemented through examining opportunities for *focusing on form* during CAT performance and measuring learning outcomes: accuracy and complexity of language output and e-literacy and English exam results. The main research outcome is that CATs have proven to be beneficial for acquiring ICT skills as well as for facilitating English language acquisition, which is viewed by the researcher as the core of e-literacy teaching.

The study could be qualified as unique as it is the first-known attempt to present and evaluate a method of delivering e-literacy in the ESOL context from a pedagogic perspective. It is based on the latest findings and practices in the areas of Task-Based Instruction (TBI), Computer-Assisted Language Learning (CALL) and Second Language Acquisition (SLA).

The theoretical study introduces the context of teaching, the author's viewpoint on e-literacy and the theoretical background of the research, which in turn justifies the need for CATs.

## 1. Theoretical Study

### 1.1 Context and Goals of the ESOL Provision

In the UK, the term ESOL is applied to teaching English to adult learners who come from such groups as settled communities, refugees, migrant workers and family partners. They have diverse educational, cultural and employment backgrounds and need English for workplace, studying in further or higher education and for living in the community. Most of them had very little or no exposure to technology before.

With the publication of the *Adult ESOL Core Curriculum* (2001), the ESOL provision became an essential part of the national strategy of *Skills for Life* alongside the provision of literacy and numeracy. ESOL is the fastest growing subject in the sector. In Huntingdonshire Regional College situated in East Anglia, the area with a rather high per cent of migrant workers, the number of ESOL applicants in 2003/2004 almost doubled and comprised 8% of the total number of students. With enlargement of the European Union in May 2004 the number of such applicants has increased dramatically throughout the country, which places ESOL in the vanguard of teaching *Skills for Life*.

Another basic skill, recently incorporated into the national curriculum for adults, is ICT. The national research (2003) revealed that many tutors and learners view ICT as an essential element of acquiring 'new literacies'. Unable to enrol for mainstream ICT courses because of their low command of English, learners need those skills to improve their job opportunities and relationship with their family members. This challenge is compounded by the need to acquire those skills in the language they are trying to learn. Taking into account the national research findings and learners' real-life needs, the author suggests formulating the main goals of ESOL provision as teaching literacy and teaching ICT with maximum proximity to real world, i.e. authenticity, which is demonstrated in Figure 1.

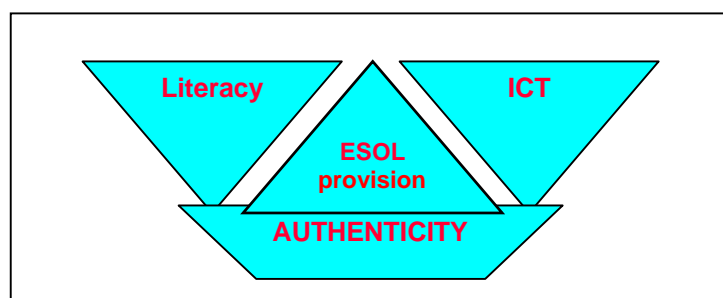


Figure-1: The goals of ESOL provision

ICT is placed here on a par with literacy. The key question is: Which literacy or literacies have to be taught?

### 1.2 E-Literacy vs. Literacies and the Problem of Delivering

Literacy is traditionally identified as ability to read and write. Nowadays, we speak about different kinds of literacies such as ethnographic literacy - "a set of social practices" (Williams:2001) or information literacy - an "ability to access, evaluate and

use information from a variety of sources” (Doyle:1994, cited in Kope:2003). At the *e-Lit 2003* conference, Kope spoke about e-literacy as a convergence of traditional, information and computer literacies with some social skills and practices. In this paper, the author adopts even a broader perspective on e-literacy within the pedagogy of *multiliteracies*. Proposed by the *New London Group* in 1996, the pedagogy of *multiliteracies* embraces *functional, academic and critical literacies*, and focuses on studying “the new types of meanings created in various realms - textual, visual and digital, as well as the multi-modal relations between the different meaning-making processes” (*The New London Group 1996:77*). In our context, this means that ESOL learners need to develop knowledge about interaction of linguistic, visual and digital *meaning-making* systems alongside acquiring practical computer skills and social practices associated with these processes, which will enable them to acquire e-literacy. Acquisition of e-literacy in the ESOL contexts also includes developing learner *oral* communication skills to perform such functions as asking for and providing information, clarifying and following teacher instructions, which implies teaching speaking and listening. In the next paragraph, some problems in delivering e-literacy will be discussed.

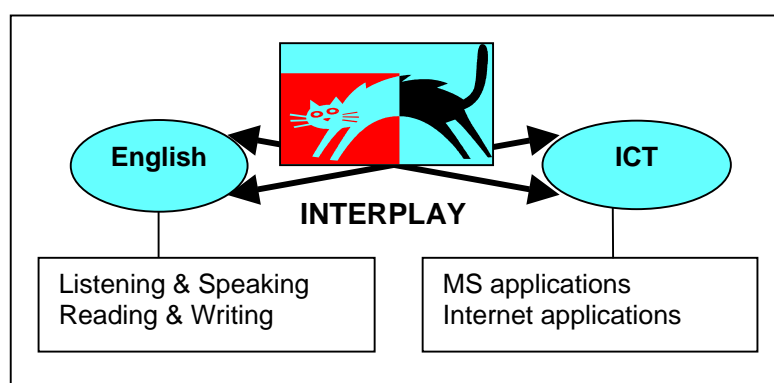
There is an array of resources available for delivering traditional literacy that is offered through the *National Literacy Curriculum*. However, they could hardly be used for teaching e-literacy, a successful delivery of which depends on solving the problem of the so-called ‘digital divide’ defined by Warschauer (2003) as ‘a gap between literacy and technology’. Referring to a number of studies (see Warschauer & Kern:2000), Warschauer claims that “literacy is acting as a gatekeeper for accessing and using technology” (2003:3). Although becoming literate is not an easy task for any student, it is especially difficult for ESOL learners operating in a second language. Low readability of IT manuals and highly jargonised language of IT instructors make mainstream IT courses practically inaccessible for the majority of ESOL learners who want to acquire computer skills and have a low level of English. On the other hand, in traditional language-only learning tasks employed in ESOL provision, a computer element, if embedded at all, is recommended as optional or merely as a tool. The same could be said about traditional CALL activities that, in addition, very often require specially designed software, which is not suitable for the ESOL context. Network-Based activities, like computer-mediated communication, focus mainly on *applying* language skills and, therefore, could be qualified as ‘knowledge-activating’ (Samuda:2001), whereas the ESOL context also requires ‘knowledge-constructing’, ‘focusing on form’ activities.

By eliciting the above problems in current teaching practice we justify a need for creating a new type of computer-based activities. They would engage ESOL learners in challenging tasks with a focus on constructing new meanings, the tasks for teaching traditional and other types of literacies as well as ICT skills, i.e. for teaching e-literacy. The next section introduces CATs as a possible means of solving the problem of ‘digital divide’.

### **1.3 CATs - Tasks for Teaching e-Literacy**

The author identifies CAT as a complex communicative task for teaching e-literacy in the ESOL context. It has two content components – English and ICT – and is strongly related to real-world practices.

Teaching English, the first content component, includes all four language skills - reading, writing, speaking and listening - activated at different stages of CAT design. Its ICT component incorporates teaching basic MS applications such as MS Word, Excel, Access, PowerPoint, Publisher, and such Internet applications as WWW and e-mail. ICT elements are distributed throughout CAT structure and are activated at each stage through learners' direct computer-based actions. The active role of the ICT component distinguishes CATs from CALL activities, which is reflected in the CAT name: in CAT 'A' stands for 'Activated', whereas in CALL - for 'Assisted'. Each component has equal value in terms of time and allocation of resources. The two components are interwoven into CAT design and interact with each other producing beneficial effects on language acquisition, as the author claims. The CAT design is graphically illustrated in Figure-2.



**Figure-2: CAT design**

The interaction, or *interplay*, of CAT content components – English and ICT - is elicited by the author as the key CAT characteristic which is claimed to affect language acquisition and, thus, make this new type of tasks efficacious for teaching e-literacy. An extract from a sample CAT “The UK Population” designed by the author for the intermediate level is reproduced in **Appendix-A**. This is the type of task that is the subject of the presented research.

## 2. Research

### 2.1 Sources

This section reflects upon some theoretical sources of creating and researching CATs. The present study was instigated by the research agenda set up by Chapelle who drew attention to the need to investigate “whether or not learners’ interaction with CALL programs is related to subsequent ability in the target language” (Chapelle, 1996:147).

Current CALL studies like the one by Gonzalez-Lloret (2003), are normally based on the use of different types of specially designed software that only provide opportunities for language use rather than engage learners in structured authentic tasks. An exception could be Pellettieri’s (2000) research that examines task-based real-time computer interaction and claims that learners achieve higher levels of

metalinguistic awareness while ‘negotiating for meaning’. While in a number of quantitative SLA studies researching traditional language-learning tasks, in such as Skehan’s (1996-2001), Doughty & Williams (1998), Foster & Skehan’s (1996), Bygate *et al*’s (2001) the performance is evaluated through measuring language accuracy, complexity or fluency, to the author’s knowledge, this method of evaluation has never been employed in current CALL task-based studies (see Egbert & Hanson-Smith:1999). An attempt was made by Laporte *et al* (1998) who evaluated a CALL programme for grammatical instruction in the Welsh teaching classroom. Sauro (2003) questions the efficacy of traditionally designed language-learning tasks for networked classrooms and calls for designing special tasks to exploit rich resources of networked environment. There are no studies reporting on the application of CALL activities to the ESOL context. The latest report on *Adult ESOL Pedagogy* (2003) only set up an agenda to ‘explore specific classroom tasks to address issues of accuracy and fluency in the spoken language and investigate different media of learning, including written materials and new technology’.

The study presented in this paper is an attempt to respond to the above pedagogic and research needs and draw scholars’ attention to researching e-literacy.

## 2.2 Methodology

The methodology for researching CATs was pulled out from the main three areas the CAT design was based on: CALL, TBI and SLA. All three meet in Chapelle’s (2001) framework for evaluating the appropriateness of CALL activities, which also incorporates Skehan’s (1998) cognitive principles for implementing TBI. These are the two frameworks employed in this paper for evaluating CATs.

Chapelle’s framework (2001:55) presents a wide spectrum of criteria, including task authenticity, the roles of context and social factors with the focus on *meaning*, the basic notion of the pedagogy of multiliteracies. Chapelle identifies the main criteria for evaluating the appropriateness of CALL activities as task *LLP*, the key element of which is *Focus on Form (FonF)*. The latter was incorporated as one of Skehan’s cognitive principles: “Maximise the chances of focus on form through attentional manipulation” (1998:132). *FonF*, the fundamental notion in SLA research, is defined as “attention to lexical forms and the meanings they realise” (Ellis, 2001:13). In TBI, a task is considered to be language learning only to the extent it provides opportunities for focusing on form which is inseparable from meaning.

Chapelle claims that “the most convincing way to demonstrate the task LLP is through studying learning outcomes” (2001:74). This could be done by using Skehan’s three dimensions of language performance - accuracy, complexity and fluency. Skehan (1998) identifies them as the goals of SLA acquisition which, in its turn is ‘learners’ process of increasing in each of these areas’ (*op.cit*). The two dimensions, associated with *form* and thus relevant for the present research, are language accuracy and complexity. Skehan defines *accuracy* as a number of error-free clauses and *complexity* – as a number of clauses per unit. As a unit of language analysis, the present research employs the *Analysis of Speech Unit (AS-unit)* suggested by Foster *et al* (2000) as ‘a unit for all reasons’ and described as

... a single speakers’ utterance consisting of an independent clause, or sub-clausal

unit, together with any subordinate clause(s) associated with either (Foster *et al* 2000:365).

AS-unit appears to be the most appropriate for measuring complex, especially oral, data of non-native speakers, full of non-finite topical, one-word utterances.

The key elements of the described frameworks were employed to implement the research goal of justifying and evaluating CATs in the ESOL context.

### 2.3 Research Questions and Design

Evaluating CATs for teaching e-literacy entailed answering the following questions:

- 1 In which way does CAT design provide opportunities for *focusing on form* and, therefore, affect CAT Language Learning Potential?
- 2 What are the long-term effects of CAT practice on language production in terms of its accuracy and complexity?
- 3 In which way do CATs affect language accuracy and complexity of a particular discourse mode (oral/written) at the elementary and intermediate level?
- 4 What are the effects of CAT practice on learner performance on e-literacy and ESOL proficiency tests?

The first question was investigated in the qualitative part of the research where CAT LLP was evaluated through examining opportunities for focusing on form-meaning illustrated by examples from the CAT-based syllabus. The quantitative part of the research embraced the rest three questions and provided numerical evidence to the effects of the *interplay* on CAT LLP. For that, CAT LLP was operationalised through measuring learning outcomes: accuracy and complexity of learner oral and written production during CAT performance at the elementary and intermediate levels and results of e-literacy and ESOL proficiency tests. Fluency, the third aspect of language proficiency, was not applicable for researching CATs as their performance involves physical actions on computer and, thus, extra time, which interferes with speech flow.

The research hypotheses stated that accuracy and complexity scores and learner performance on e-literacy tests would increase by the end of the course; also, that learner performance on ESOL proficiency exams in the experimental group would be higher than in the control group. In the author's opinion, that compound would produce sufficient evidence to the efficacy of the newly introduced tasks for teaching e-literacy.

### 2.4 Participants

There were two groups of participants in the study: experimental and control, typical ESOL learners from different educational and cultural backgrounds. The experimental group comprised 15 adults who followed the *ESOL+ICT* syllabus, based on CATs, and who also attended traditional ESOL classes. They were divided into elementary and intermediate classes, according to their levels of English proficiency, which accidentally corresponded to the level of their ICT competence: 80% of the elementary class were complete ICT beginners; the others had very basic computer skills. Such combination yielded a poor level of learners' e-literacy, which was,

however, compensated by their high level of motivation. The latter was the main beneficial factor in the process of 'bridging a gap between literacy and technology'. The courses consisted of 68 contact hours for elementary and 44 for the intermediate class. By the end of the study, before ESOL examinations took place, the control group of 36 ESOL learners, who had not been using CATs, was added to the study in order to compare the learning outcomes.

## 2.5 Data and Data Collection

The research data were collected during the period of eleven months. Those were recordings of *ESOL+ICT* lessons, learner output during CAT performance, learners' essays about the course, their results in two internal e-literacy tests and the end-of-the-year external ESOL exam, CAT-based syllabus and samples of individual CATs. The learner output included oral narratives or interactions during CAT performance and short pieces of writing from both experimental classes. Out of the collected data, three sets of CAT output were selected at Times 1-3 - at the beginning, middle and end of the course, then transcribed, coded and analysed, employing techniques suggested by Foster *et al* (2000). While the e-literacy tests were administered in the experimental group only, the ESOL Pitman's exam were administered both in the experimental and control group.

## 2.6 The Qualitative Research

### *Evaluating CAT Language Learning Potential: e-Literacy in action*

In this part of the research, CAT LLP is empirically evaluated through examining opportunities for focusing on form and meaning provided by the *interplay* between the two content components, English (L2) and ICT, in the CAT "The UK Population" (**Appendix-A**) designed by the author for the intermediate level.

The interplay between the two components is already built in the CAT aim and objectives: 'teaching the ways of presenting (ICT) and analysing (L2) statistical data'. The CAT *input* and learner *output* are delivered in the form of e-mail attachments, i.e. teacher-learner-teacher written asynchronous communication, which is accompanied by their oral synchronous communication, with all four L2 skills being involved. Then the interplay manifests itself throughout four phases of the CAT complex structure developed on the basis of Willis's (1996) model for implementation of TBI. Finding statistical information on the web for Task-1 requires both ICT skills of searching and L2 skills of skim reading. The linguistic *output* of this task acts as an *input* for the following Tasks-2 and 3 - creating tables and charts in MS Excel, which are challenging knowledge-constructing activities. At those stages, learners' previous knowledge of ICT helps them understand and follow written instructions. At the production stage, Task-4, learners use both linguistic and ICT sources to produce the target language of statistical analysis, comparatives in this case: their interlanguage resources, L2 'mined' (Samuda:2001) from the CAT input (Step-8) and obtained web pages (Step-1), target structures provided in the vocabulary box (Step-9) and the output of all previous stages.

The interplay instigates two types of oral communication during CAT performance: forced and natural. In Steps 3 or 8, marked with a pictorial sign, learners are forced by

CAT design to communicate with their partners to compare their results and *negotiate for meaning*. Natural communication takes place every time when less computer literate learners need help to perform IT actions and ask their partners or tutor for explanations.

As it was discussed earlier, the main aspect of task LLP is form-meaning relations. To evaluate CAT LLP from a pedagogic perspective in the empirical research like this one, it is necessary to answer the question: “What evidence indicates that learners focus on form-meaning during CAT performance?” In the following section, some ‘implicit and explicit’ methods (Ellis:2001) of focusing on form-meaning are illustrated.

### ***Ways of Focusing on Form-Meaning in CAT Design***

In the CAT “The UK population” learners have to concentrate not only on performing IT activities but, also, on the language forms they need to compare the charts with. Such visual tools of the Excel application as icons, colour, font size, tabs and chart elements direct learners’ attentional resources to target language, preparing their oral and written production. It is an example of *implicit* focusing on form. Its effects, an actual *uptake* of the linguistic comparative form, one of the CAT objectives, occur at a later stage, when learners present the captions they wrote for their charts. The learner who made mistakes in her captions then corrected herself, ‘modified her output’ (Swain:1995) during the production stage( see Appendix-B).

Such MS Word-based techniques as ‘cutting and pasting’ proved to be very effective for *implicit* FonF-meaning. In the CAT “Applying for a job”, learners need to reconstruct a correct sequence of paragraphs containing target modal verbs. They have to juggle with the paragraphs on the screen before the meaning of the text is reconstructed, which *implicitly* directs their attentional resources to the target forms. This technique is reinforced by illuminating the target forms in **bold** in the CAT input, which creates opportunities for learners to ‘notice’ them and ‘fill in gaps’ in their interlanguage by ‘mining’ (Samuda:2001) the ways of expressing epistemic modality long before the production stage. This allows us to categorise CATs as linguistically-orientated ‘consciousness-raising’ (Ellis:1998a) tasks.

An example of *explicit* FonF could be a box with target structures in CAT input (Tasks-4), or tutor’s direct metalinguistic explanations that usually occur at the past-task stage. The Internet provides plenty of opportunity for manipulating learner attentional resources on form-meaning. Its digital images and hypertext allow teachers to create a comprehensive input. One of the examples of such task is a metalinguistic CAT “Investigating a jam sandwich” that *explicitly* focuses on functions of parts of speech. Making individual PowerPoint presentations on the basis of a virtual sample is a creative and efficient way of acquiring new literacies, as the analysis of learners’ output and essays revealed. The highly interactive, malleable and collective nature of computer-mediated texts, like e-mail or weblogs, allows them to be used in CAT design not only as sources of performance but rather as thinking devices to help students and teachers collaboratively generate new *meanings*. That creates perfect environment for teaching e-literacy as part of the pedagogy of multiliteracies.

The above examples illustrate some advantages of CATs in comparison to other

language-learning materials: adaptation of IT instructions according to learners' language abilities, involvement of all types of communication, including oral, which is much desired for SLA, and acquisition of ICT skills while performing language activities. However, the most prominent advantage of CATs is that linear and 3D textual and visual elements of their design, such as hypertext, digital formats, shapes and colours, interact to produce new *meanings*, which is crucial for the pedagogy of multiliteracies. Learners' attentional resources are directed to the target language forms by an *accumulative effect* of those elements, which is also reinforced by physical computer actions performed for task completion. In this way, CAT design creates an authentic environment of real-life tasks through providing interplay between English and ICT components that constantly feed each other ensuring their development and, thus, acquisition of e-literacy.

The qualitative research provided *empirical* evidence of how the CAT key feature, the interplay between English and ICT components, positively affects CAT LLP facilitating acquisition of traditional literacy as well as information, digital, visual, etc. literacies and computer skills, i.e. of e-literacy. The quantitative part provides *numerical* evidence and tests the empirical findings and the tutor-researcher's beliefs.

## 2.7 The Quantitative Research

### *Variables*

To answer Research Questions 2-3 stated earlier in Section 2.3, seven variables were selected for describing the data: one independent variable of *time*, the four dependent variables, "variables in focus", (Brown,1988:10) *language complexity*, *accuracy*, *level of e-literacy* and *level of ESOL proficiency*, and two moderator variables - *discourse mode (oral and written)* and *level of English (elementary and intermediate)*.

Among those, the *level of e-literacy* needs to be described in more detail as this variable was introduced by the researcher for the purposes of this particular study and is not mentioned in current research literature. The *e-literacy level* was measured by scores of the internal e-literacy tests that were designed and administered by the course tutor and validated by the college department administration team. The e-literacy tests replicated the format of Pitman's ESOL written exams but with an ICT component incorporated on the same principles as in CAT design. They aimed to test vocabulary, acquisition of reading and writing as well as ICT skills within the multiliteracies approach adopted by the author. Its reading module, for instance, included a task on finding and processing particular information from the Internet.

The two moderator variables described how complexity and accuracy scores differed for oral and written performance and at which level, elementary or intermediate, the effects of CAT practice were more salient. These variables were interacting with each other at the same time as well.

### *Data Analysis*

For analysing the data, some basic methods of descriptive statistics were employed, like comparing the values of means and standard deviation and test scores. Tables 1 & 2 present the effects of CAT practice on accuracy and complexity of oral and written

production in the elementary and intermediate classes of the experimental *ESOL+ICT* group at the start, middle and end of the study and the correlation between the two variables.

It is clear from the visual inspection of the mean scores in Tables 1 & 2 that the percentage of error-free clauses and an average number of clauses per AS-Unit increased by the end of the course at each level, both in oral and written production, though the increase was more prominent in oral accuracy (by 0.19) and written complexity (by 0.61). Another common observation is that there appeared to be a strong positive correlation between oral & written production for both variables. An overall increase in oral performance was accompanied by an increase in the written one across the whole period, though the tendency slightly decreased by the end of the course. The patterns of behaviour of the variables look different. We will describe them in more detail starting with *accuracy* results presented in Table 1.

Time of data collection	Time-1 Start		Time-2 Mid		Time-3 End		Improvement	
	Or.	Wr.	Or.	Wr.	Or.	Wr.	Or.	Wr.
Level/Discourse mode								
Elem. (ave. <b>0.54</b> )	0.52	0.41	0.60	0.53	0.71	0.49	0.19	0.08
Interm. (ave. <b>0.65</b> )	0.61	0.56	0.65	0.59	0.81	0.67	0.20	0.11
Experimental-Group	0.57	0.49	0.63	0.56	0.76	0.58	<b>0.19</b>	<b>0.09</b>
SD	0.16	0.14	0.15	0.12	0.16	0.13		
Or./Wr. correlation	0.56		0.31		0.15			

**Table 1: The effects of CAT practice on accuracy**

Compared by a discourse mode, there was a striking difference between oral and written production: an increase of oral accuracy was considerably higher during the course than that of the written one, on average by 0.10. Compared by level, at the intermediate the scores were higher than at the elementary at each time, which was anticipated by the tutor. However, the difference in average improvement of oral accuracy between the levels is not marginal (0.20 vs. 0.19), which testifies to beneficial effects of CATs on oral accuracy for both levels. On the whole, Table-1 presents quite a homogeneous picture of accuracy results in the study, which is testified by the values of standard deviation.

The figures of *complexity* in Table 2 present a more diverse picture than in case of accuracy. The most striking effect is that right from the start, learners at the elementary level produced a more complex language, on average by 0.19, with the figures more polarised in oral discourse. Also, the improvement in written mode was on average considerably higher than in oral (0.61 vs. 0.32). This pattern of superiority of written complexity scores sustained all through the course and had not been predicted by the researcher. A wide range of SD values in Table-2 illustrates a more polarised picture of learner performance on complexity.

Time of data collection	Time-1 Start		Time-2 Mid		Time-3 End		Improvement	
	Or.	Wr.	Or.	Wr.	Or.	Wr.	Or.	Wr.
Discourse mode								
Elementary (ave.1.59)	1.17	1.38	1.45	1.75	1.71	2.09	0.54	0.71
Intermediate (ave. 1.40)	1.09	1.34	1.22	1.73	1.18	1.85	0.09	0.51
Experimental Group	1.13	1.36	1.33	1.74	1.45	1.97	<b>0.32</b>	<b>0.61</b>
SD	0.07	0.24	0.28	0.19	0.41	0.28		
Or/Wr Correlation	0.83		0.76		0.74			

**Table 2: The effects of CAT practice on complexity**

The behaviour of both moderator variables could be summarised as follows:

- 1 During the period of study, the overall level of accuracy and complexity in the experimental group increased in oral and written mode both at elementary and intermediate levels. This supports the research hypothesis and testifies to the fact that the CAT special characteristic, interplay between the language and ICT components, had overall positive effects on the two dimensions of language production concerning *form*. The language performance in terms of complexity was higher than of accuracy. However, no clear pattern was discovered in the correlation between these two variables.
- 2 The overall level of complexity was higher at the elementary level (by 0.19), while the overall level of accuracy was higher at the intermediate level (by 0.11) across the study. The rate of improvement of oral accuracy at the elementary level was almost the same as at the intermediate (0.19 & 0.20). However, the overall scores of oral accuracy were 0.10 higher than those of written. The complexity results, on the contrary, were higher (by 0.29) in the written mode. The improvement in written complexity at the elementary level was the highest out of the total 8 possible options of the research.

Learners' improvement in language parameters was accompanied by their improvement in acquisition of ICT skills. That was confirmed by the results of internal e-literacy tests. The overall e-literacy scores improved by 14% by the end of the study, though the effects of CAT practice on e-literacy were more significant at the intermediate level (0.21 vs. 0.09).

The most important for testing the research hypothesis were the results of the external ESOL exams. While in the control group, 4 learners failed in oral and 2 in the written exam, in the experimental group, all learners *passed* the oral exam and only 1 'failed narrowly' in its written component. Though there were more "1<sup>st</sup> class passes" in the control group, the combined passing results were higher in the experimental group: 100% vs. 89% in oral and 86% vs. 80% in the written exam. This confirms strong positive effects of CAT practice on facilitating SLA.

The above results illuminate positive long-term effects of CAT practice on accuracy and complexity of language performance and numerically support the research hypothesis that CATs introduced in this study have a strong language learning potential that enables them facilitate English language acquisition and, thus, be efficacious for teaching e-literacy.

### 3. Research Outcomes and Implications

The present study has two main outcomes: that specially designed for teaching e-literacy Computer-Activated Tasks are able to improve oral language production as well as written and that they could be beneficial for teaching not only at the intermediate but, also, at the elementary level.

These outcomes overthrow two common assumptions in current pedagogic practice. It has always been assumed that CALL activities are more beneficial for improving learners' writing and reading skills rather than their oral production, and at the intermediate level rather than at the elementary one. Therefore, most published CALL activities, like in Dudeney's (2000), are designed accordingly. The present research, however, has revealed beneficial effects of such activities at the *elementary* level in terms of both complexity and accuracy of language production. The *oral accuracy* and *written complexity* appeared to have improved considerably at this level. This discovery is considered by the researcher as a real asset for pedagogic practice, at least for the ESOL context.

It does not mean, however, that *any* type of computer-based activities could be beneficial in that way. The study has demonstrated that only newly introduced, specially designed Computer-Activated Tasks, with their two equal content components, English and ICT, and the interplay between them, their unique feature, only CATs are able to cause those positive effects and facilitate e-literacy acquisition.

The implications of the study should be considered in the light of its strengths and limitations. The main strength is that it introduced and justified new tasks for teaching e-literacy and described the method of evaluating them through measuring language production and learner performance on e-literacy tests. The empirical study was numerically supported by a practitioner-led small-scale but longitudinal research in intact classes. The study appeared to be the first attempt that combines the best practices in TBI and CALL with the latest findings in SLA and responds to real-life pedagogic needs of the ESOL context. The main finding of the study is a discovery that specially designed computer-based activities could be beneficial for improving not only written but also oral production and at the elementary as well as intermediate level. This could be regarded as the author's contribution to current practice in TBI, CALL and Basic Skills.

However, the experimental nature and considerable length of the study produced certain limitations, the main one being its small scale. It was impossible to control such variables as course attendance, which affected the size of the sample in the experimental group. Also, a variable of CAT type, though deliberately ignored, could not be fully eliminated and produced some side effects, undermining the research reliability. Therefore, consumers of this research should make generalizations in a cautious manner.

The fact that CATs were designed and tested for the ESOL context could be regarded as a strength rather than a limitation. CAT design, based on general principles of TBI and SLA, could be adapted for any other English teaching context, which raises the generalisability of the study and makes it replicable in other contexts that involve

teaching e-literacy.

## Conclusions

The study reported in this paper introduced CATs as a method and means of teaching e-literacy and investigated their efficacy for the ESOL context. Employing Chapelle's framework for evaluating CALL activities and Skehan's cognitive approach to TBI, the study confirmed the researcher's belief in positive long-term effects of CAT practice on acquisition of English and ICT skills, the core of teaching e-literacy. The study has proven CAT efficacy for improving learner oral as well as written production, both at the elementary and intermediate level, which may affect current ESOL and Literacy teaching practices.

The theoretical part of the study described the context of teaching and justified a need to design special tasks for teaching e-literacy that could solve the problem of 'digital divide'. E-Literacy is described within the perspective of the pedagogy of multiliteracies as convergence of traditional, information, computer and other types of literacies and oral communication skills with the focus on creating new meanings based on interaction of linguistic, digital and visual environments. Though being categorized as language-learning tasks, CATs also contain an equally strong ICT component in their design. The *interplay* between these two components was identified as the CAT key characteristic that affects their LLP and ensures acquisition of e-literacy.

The qualitative part of the research illustrated how the interplay affects CAT Language Learning Potential through provision of opportunities for focusing on form-meaning and how it enhances possibilities of 'noticing' and 'filling gaps' in learner knowledge. This is achieved through manipulation of attentional resources within CAT design.

In the quantitative part of the study, the CAT LLP was evaluated and operationalised through measuring learning outcomes, accuracy and complexity - the two language dimensions mostly associated with *form*, - learner performance on internal e-literacy tests and external ESOL examinations. The behaviour and correlation of seven variables were investigated to produce numerical evidence to the research hypothesis that CATs are beneficial for teaching e-literacy.

The unique dual nature of CATs makes them attractive for teaching in any context where a compound of language and ICT is needed. They might be applied to teaching literacy and basic skills in Further Education, or e-literacy and study skills for overseas undergraduate students. Due to a rapid pace of technology, the task of teaching e-literacy - 'bridging the divide between technology and literacy' - could be regarded as a perpetual theme of a pedagogic 'perestroika' of a new millennium.

## Key References

- Adult ESOL Pedagogy* (2003). A review of research. [www.literacy.lancas.ac.uk](http://www.literacy.lancas.ac.uk)
- Brown, J.D. (1988). *Understanding Research in Second Language Learning*. CUP.
- Bygate M, Skehan, P. and Swain, M. (eds.) (2001). *Researching Pedagogic Tasks: Second Language Learning, Teaching and Testing*, London:Longman.
- Chapelle, C.A. (1996). "CALL-English as a Second Language" in *Annual Review of Applied Linguistics*, 16:139-157.
- Chapelle, C.A. (2001). *Computer Applications in Second Language Acquisition. Foundations for Teaching, Testing and Research*, CUP.
- Doughty, C. & Williams, J. (1998). *Focus on Form in Classroom Second Language Acquisition*, CUP.
- Dudeny, G. (2000). *The Internet and the Language Classroom*. CUP, UK.
- Egbert, J. & Hanson-Smith, E. (eds.) (1999). *CALL Environments. Research, Practice, and Critical Issues*. TESOL Inc. USA.
- Ellis, R. (1998a). "Evaluating and Researching Grammar Consciousness-Raising Tasks" in Rea-Dickens & Germaine (eds.), *Managing Evaluation and innovation in Language Teaching: Building Bridges*, 1998:220-252.
- Ellis, R. (2001a). "Task-Based Research and Language Pedagogy" in *Language Teaching Research*, 4,3:193-220.
- Foster, P. & Skehan, P. (1996). "The Influence of Planning and Task Type on Second Language Performance" in *Studies in SLA*, 18:299-324.
- Foster, P., Tonkyn, A. & Wigglesworth, G. (2000). "Measuring Spoken Language: A Unit for All Reasons" in *Applied Linguistics*, 21/3:354-75.
- Gonzalez-Lloret, M. (2003). "Designing Task-Based CALL to Promote Interaction: En Busca de Esmeraldas" in *Language Learning & Technology*, 7, 1:86-104.
- Hanson-Smith, E. (2001). "Computer-Assisted Language Learning" in R.Carter & D.Nunan (eds.), *The Cambridge Guide to Speakers of Other Languages*, CUP, 2001:107-13.
- ICT and Adult Literacy and Numeracy Research Review* (2003). Lancaster Literacy Research Centre. [www.literacy.lancs.ac.uk](http://www.literacy.lancs.ac.uk)
- Kope, M. (2003). *E-Literacy– A Broader Definition*.  
[http://www.iteu.gla.ac.uk/elit/elit2003/papers/kope\\_web.html](http://www.iteu.gla.ac.uk/elit/elit2003/papers/kope_web.html)
- Laporte, N. Ellis, N.C., O'Dochartaigh, C., Hicks, B., Hughes, E., Quinn, P. &

- Morgan, M. (1998). "The Design and Evaluation of a second Language Tutoring system. What works, what doesn't". [www.linguanet.org.uk/research/resfor2/](http://www.linguanet.org.uk/research/resfor2/)
- Levy, M. (1997). *Computer-Assisted Language Learning: Context and Conceptualization*. OUP.
- Long, M. (1991). "Focus on Form: A Design Feature in Language Teaching Methodology" in K. de Bot, R. Ginsberg & C. Kramsch (eds.), *Foreign Language Research in Cross-Cultural Perspective*, Amsterdam: John Benjamins, 1991:39-52.
- Nunan, D. (1989). *Designing Tasks for Communicative Language Teaching*, CUP.
- Pellettieri, J. (2000). "Negotiation in Cyberspace: The Role of Chatting in the Development of Grammatical Competence" in Warshauer *et al*, 2000:59-85.
- Samuda, V. (2001). "Guiding Relationships between Form and Meaning during Task Performance: The Role of the Teacher" in Bygate *et al* (eds.), 2001:119-40.
- Sauro, S. (2003). *Exchanges in Cyberspace: CMC Tasks for the Networked Classroom*, Paper presented at World CALL Annual Conference, May 2003.
- Shetzer, H. (1998). *Electronic Literacies: Bridging the Gap*. Paper presented at the 1998 conference of TESOL teachers, Seattle, WA.  
<http://eslplanet.com/tesol98/literacy.electlit.html>
- Skehan, P. (1996). "A Framework of the Implementation of Task-based Instruction" in *Applied Linguistics*, 1:38-62.
- Skehan, P. (1998). *A Cognitive Approach to Language Learning*, OUP.
- Skehan, P. (2003). "Task-Based Instruction" in *Language Teaching*, 36:1-14.
- Slaouti, D., Pennels, S. & Weatherhead, H. (2000). "In Search of a Role for Email and the WWW in Improving the Writing of Bilingual Learners" in M. Beaumonti & T. O'Brien, (eds.), *Collaboration Research and Second Language Education*, Trentham Books, 2000:53-65.
- Swain, M. (1995). "Three Functions of Output in Second Language Learning" in G. Cook, & B. Seidlhofer (eds.), *Principle and Practice in Applied Linguistics*, OUP, 1995:125-44.
- The New London Group (1996). "A Pedagogy of Multiliteracies: Designing Social Futures", *Harvard Educational review*, 66, 1:60-92.
- The Use of ICT with Literacy and Numeracy Learners* (2001). Summary of the research, Institute of Education, University of London.  
[www.ufildt.co.uk/press/papers/literacyguide](http://www.ufildt.co.uk/press/papers/literacyguide)
- Warschauer, M. & R. Kern (eds.) (2000). *Network-Based Language Teaching. Concepts and Practice*. CUP, USA.

Warschauer, M. (2003). *Literacy and Technology: Bridging the Divide*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, Illinois. [www.gse.uci.edu/markw](http://www.gse.uci.edu/markw)

Williams, E. (2001). "Literacy Debates: Reflections on the International Literacy Conference, Cape Town, Nov. 2001" in *BAAL News*, 71, Summer 2002.

Willis, J. (1996). *A Framework for Task-Based Learning*, Longman, UK.

**APPENDIX-A: An extract from CAT 12: “THE UK POPULATION” (© M. Burrell)**

**Aim:** Teaching the ways of presenting and analysing statistical data.

**Objectives:**

1. Practise the pronunciation of complex numbers, percentages and fractions.
2. Identify the best searching techniques for finding statistical data on the WWW.
3. Practise using formula and creating charts in MS Excel.
4. Conduct basic statistical analysis in oral and written form using the language of comparisons.

**PRE-TASK ACTIVITIES**

2. Study the examples of e-texts and discuss:

- What are the ways of presenting statistical data?
- What are the types of charts?
- What kind of data would statistics on population include?

...

**TASK-1: FIND STATISTICAL INFORMATION ON THE INTERNET**

**Step-1: Find** information on the Internet about the population of England, Scotland, Wales and Northern Ireland using different search techniques. **Key phrases:** “population”, “statistics”, “UK population”, “UK statistics”, “England”, “UK census” etc.



**Step-2: Compare** your results with your partner’s:  
Whose search produced the quickest results? Why?

**TASK-2: CREATE, EDIT AND FORMAT A TABLE**

**Step-3: Create a spreadsheet** in MS Excel as below (**Table-1**) and **enter** your data.

**Table –1: Population of the UK - 2001**

<i>Country</i>	<i>Population</i>
England	
Scotland	
Wales	
Northern Ireland	



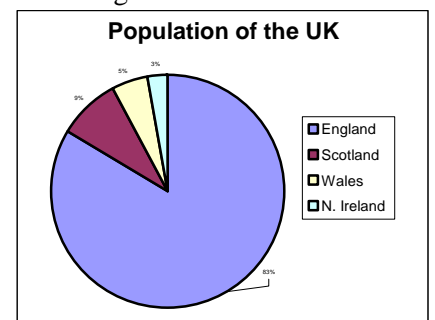
**Step-6: Compare** your results with your partner's: What are the ways of inserting the ratios?

**TASK-3: CREATE, EDIT AND FORMAT A CHART**

**Step-7: Insert a chart** in your table selecting the type from the menu or using one of the samples below. You may experiment with colours and fonts.

**Step-8: Compare** your chart with your partner’s:

- What are the chart elements?
- Which type of chart do you find *easier to create, more practical and suitable* for your purposes?
- What makes a chart more *attractive, legible, comprehensible, explicit, comprehensive*?



**APPENDIX-A (cont.)**

**TASK-4: ANALYSE THE DATA**



**Step-9: Describe** to your partner the statistical data in the table and chart you have created using the expressions from the box below. **Insert 5-10 captions** with your statements into your worksheet.

*as many/much ... as*                      *greater than*                      *not as many/much ... as .....*  
*The estimated population of ... is much/ ... times/considerably bigger/smaller than ....*  
...

**Step-10: Make short presentations in small groups** "The population of the UK in statistics" using the statistical analysis you have conducted and the prompts below: ...

**APPENDIX-B:** An extract from the transcript of learner-teacher interaction during the performance of CAT 12 “The UK Population”.

**Provision for *Focusing on Form*: ‘Negotiation of Meaning’ & ‘Modified Output’.**

**Teaching technique ‘leading from behind’**

.....

T: ... So we’ve created the table and can compare the data manually. Now look at the chart you have created. What is it for?

S1: The charts are to represent the (0.5) it’s (1) the number of population.

S2: Like a scale.

‘Leading from behind’ > T: To make it *more visual*?

S1: Yeh, to *compare the data*.

‘L from B’ > T: OK. Let’s compare. The population of which country is *bigger*?

S2: England.

Interlanguage > S1: England is *bigger the most*.

Target L> S2: The ratio of population (1) of England is **the biggest** (0.5) in the UK.

T: What about the population of Wales?

Interlanguage > S1: The population of Wales *constitutes about* (1) *err* (1) *more than* Northern Ireland? (1.5) No.

‘L from B’ > T: Right. It *constitutes about* ...

S1: percentage (3) *em...*

‘L from B’ > T: *How many per cent does it constitute?*

S1: [Four]

Target L> S2: [*Four point nine per cent.*]

S1: ... *ninety-three*

Target L> S2: *About five per cent.*

T: Yes, you can say that. Now can you compare it with the population of Northern Ireland?

Interlanguage > S1: The estimated population of Wales *is nearly 5 times bigger than* N. Ireland.

‘L from B’ > T: *Bigger than N. Ireland?* (1)...

Target L> S2: *bigger than* population *of* N. Ireland.

T: Yes, bigger than the population!

Target L> S1: *than that of* N. Ireland?

Uptake > S2: The estimated population of Wales *is nearly 5 times bigger than that of* N. Ireland.

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