Towards ICT-integrated language learning

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Chapter 2

CONCEPTUAL FRAMEWORK

2.1 Introduction

Developing an implementation framework for ICT-Integrated Language Learning that can contribute to bridging the gap between the potential of use and the practice of use requires taking into account current perspectives on the implementation of ICT for language learning purposes, or the implementation of ICT for educational applications more generally. In this chapter, the main theories and research findings by which this study has been informed will be outlined, together with a description of why they are regarded as relevant for the topic under discussion. The conceptual framework thus established will guide the discussion of implementation aspects in the chapters that follow, acting as the backbone to the themes which will be fleshed out further by reference to additional literature, examples of use and survey evidence.

Before specifying how existing frameworks and related studies help us tease out the relevant aspects of implementation, the concept of ICT-Integrated Language Learning upon which this study is built will be presented in more detail.

2.2 ICT-Integrated Language Learning

ICT-Integrated Language Learning (IILL) is not a generally accepted term to describe the use of computers in language teaching and language learning. It has been coined to indicate the primary focus of the present research on technology-enhanced learning in which ICT has been embedded into the learning of second or foreign languages in the institutional context. Since attention is directed to instructed language learning, the term – like its better-known counterpart CALL – also covers teaching by means of technology.
The generic term ICT (Information and Communication Technology) is used more or less synonymously with ‘computers’, ‘computer technology’, or simply ‘technology’, but its component parts underscore both the information processing and communication aspects which are important to language learning. Although IILL will sometimes be used interchangeably with CALL, it has also been chosen to indicate the relationship with educational technology more generally and to allow for discussion of administrative or organisational aspects of the use of technology for language learning, which are not always associated with the term CALL. Like CALL, IILL does not refer to a particular school of thought or approach to using computers for language learning and teaching. It subsumes many different types of using computer technology for language learning and teaching, expressed by acronyms such as ICALL (Intelligent CALL), WELL (Web-Enhanced Language Learning) and NBLT (Network-Based Language Teaching).

IILL crucially depends on the concept of integration. Integration quite literally refers to “the act or process of combining two or more things so that they work together” (OALD Online, 2009). Following this definition, ICT-Integrated Language Learning concerns “the act or process of combining ICT and language learning so that they work together.” The act or process of combining these corresponds to our notion of ‘implementation’. In fact, implementation, as will be demonstrated later, involves many acts and processes operating at the same time. Implementation of ICT for language-learning purposes then primarily addresses how technology and pedagogy can be attuned to yield favourable conditions for language learning.

But it cannot do so without taking into account the environmental context in which language learning and teaching takes place. Hubbard and Levy (2006b) put this point quite forcefully when they remark:

Language teachers and learners operate within a set of interrelated constraints. These constraints, often associated with the limited time
and resources available to the teacher and the student, typically include the number of contact hours pre-determined for a course, lesson times and durations, technical support, ancillary learning materials, and so on. The language teacher needs to be able to identify and understand the impact of authentic constraints and to be able to work creatively within them.

(Hubbard & Levy, 2006b: 8)

The educational environment in its broadest sense, then, is another vital aspect of integration. Although more aspects may be identified, it is usually possible to relate them to pedagogy, technology and educational environment, or a combination of these. We therefore regard pedagogy, technology and environment as the core elements of integration. The interrelationships between the three constituent elements are illustrated in Figure 1 below.

Figure 1: The core elements of integration

Double arrows are used to indicate that modifications in each of the constituent areas may impact on (coincide or clash with; necessitate or cause) developments in any of the other areas. In this context, implementation should be regarded as the acts or processes of combining pedagogy,
technology and environment “so that they work together”. In discussing the multifaceted implementation of ILL, we will regularly refer to these elements to highlight specific aspects of integration.

2.3 Related concepts

2.3.1 Add-on vs add-in applications

In addressing technology integration in language learning and teaching in Finland, Taalas (2005) makes a useful distinction between “add-on” and “add-in” models of implementation. Add-on models are characterised by activities “that ha[ve] in the past been carried out in a more traditional way” (p. 82). Such add-on models typically require fewer changes in the language learning setting than add-in models, which are more fully integrated into the classroom setting. Add-on models of technology use are often associated with the type of change referred to as ‘substitution’, whereas add-in models are usually linked up with a type known as ‘transformation’ (Westera, 2004). Transformation constitutes a more radical break with traditional teaching practices and is therefore generally more difficult to achieve. Taalas (2005) has a strong focus on technology integration, i.e. on developing add-in applications which require a transformation of existing teaching practices. A key aspect of this, she argues, is teacher training and professional development in which the focus is on pedagogy rather than technology. Since teacher training and professional development represent actions in the environmental domain of our model, Taalas’s discussion also exemplifies how technology, pedagogy and environment must be linked to address the issue of integration in full.

2.3.2 Normalisation

A frequently cited concept in relation to the integration of CALL is ‘normalisation’, outlined in Bax (2003) and further illustrated in Chambers and Bax (2006). Normalisation is a “stage when the technology becomes
invisible, embedded in everyday practice and hence ‘normalised’” (Bax, 2003: 23). CALL, it is argued,

… will reach this state when computers (probably very different in shape and size from their current manifestations) are used every day by language students and teachers as an integral part of every lesson, like a pen or a book. Teachers and students will use them without fear or inhibition, and equally without exaggerated respect for what they can do. They will not be the centre of any lesson, but they will play a part in almost all. They will be completely integrated into all other aspects of classroom life, alongside coursebooks, teachers and notepads. They will almost go unnoticed.

(Bax 2003: 23-24)

Although normalisation is a valuable concept when it comes to addressing the issue of how to embed CALL into everyday language teaching and learning practice, it should be noted that Bax (2003) and Chambers and Bax (2006) have a strong focus on integrating CALL with existing classroom practices and resources. A framework of implementation should also consider to what extent the position of the classroom will be maintained as a result of the introduction of ICT.

2.3.3 Vertical vs horizontal integration

Another useful observation with regard to integration is made in Levy and Stockwell (2006). They make a distinction between ‘vertical’ and ‘horizontal’ integration. Both types of integration are related to the environmental aspects of integration introduced above. Vertical integration concerns integration from the institution-wide perspective, considering the implications of, for instance, technical support, choices in hardware and software and changes in the educational culture within the institution. Horizontal integration, on the other hand, looks at the use of technology inside the institution in relation to the technology that students are used to using outside the educational context,
as part of their everyday experience with technology. It may be profitable, they claim, to establish some kind of ‘continuity’ between the technology used inside and outside the educational context (Levy & Stockwell, 2006: 230-233).

2.3.4 HE as context of study

At the end of this introduction to the concept of IILL, it should be pointed out once more that in this study integration is explored with reference to a Higher Education context where opportunities for face-to-face (class-based) learning co-exist with opportunities for learning with computers. This context will occasionally be referred to in the text as a ‘blended’ HE setting. The intended framework considers how implementation can be achieved by taking into account aspects of pedagogy, technology and environment in this HE language learning environment. It does not address other levels of education or private home learners, where conditions for use may differ substantially from those in HE.

2.4 Task-Based Language Teaching

Our primary perspective for exploring the pedagogical aspects of integration is based on a language teaching approach, known as task-based language teaching (TBLT), sometimes referred to as task-based instruction (TBI). TBLT is a form of communicative language teaching (CLT), which is currently gaining momentum as a methodology for language learning, both at the level of classroom practice and education policies (cf. e.g. Leaver & Kaplan, 2004; Nunan, 2004). TBLT shares with CLT a primary focus on meaning as the guiding principle of the language learning process, but it emphasises the role of pedagogical tasks. Tasks provide the context for students to work together or individually to accomplish a particular goal. Students will acquire language through the negotiation of meaning that occurs in the context of performing the task. Negotiation of meaning will engage the cognitive processes needed for language acquisition. As Nunan (2004) points
out, TBLT has contributed to pedagogy more generally by strengthening the following principles and practices:

- A needs-based approach to content selection.
- An emphasis on learning to communicate through interaction in the target language.
- The introduction of authentic texts into the learning situation.
- The provision of opportunities for learners to focus not only on language but also on the learning process itself.
- An enhancement of the learner’s own personal experiences as important contributing elements to classroom learning.
- The linking of classroom language learning with language use outside the classroom.

(Nunan, 2004: 1)

The central construct in TBLT is ‘task’, for which different definitions have been suggested since the inception of TBLT in the mid-eighties of the previous century. Reviews of definitions proposed for ‘task’ in the past decades can be found in Ellis (2003: 4-5), Nunan (2004: 2-4), Van den Branden (2006: 4, 7-8) and Samuda and Bygate (2008: 62-70). A definition covering most aspects of TBLT is provided by Ellis (2003):

A task is a workplan that requires learners to process language pragmatically in order to achieve an outcome that can be evaluated in terms of whether the correct or appropriate propositional content has been conveyed. To this end, it requires them to give primary attention to meaning and to make use of their own linguistic resources, although the design of the task may predispose them to choose particular forms. A task is intended to result in language use that bears a resemblance, direct or indirect, to the way language is used in the real world. Like other language activities, a task can engage productive
or receptive, and oral or written skills, and also various cognitive processes.

(Ellis, 2003: 16)

Tasks are learner-centred and goal-directed. Success or failure is measured by evaluating whether the goal has been achieved. Tasks focus learners’ primary attention on meaning, but, crucially – and this sets TBLT aside from several other CLT approaches – they also direct attention to formal language aspects. Tasks are (semi-)authentic and can be applied for all language skills.

TBLT constitutes a radical break with approaches in which formal language aspects, particularly grammar, are the point of departure for curriculum design and teaching practice. Willis and Willis (2007) point out that such approaches, which often take the form of Presentation → Practice → Production (PPP) sequences, typically focus on language structure by presenting and practising isolated language forms. Although these forms are often subsequently practised in communicative contexts, students may be more concerned with “getting it right” than with conveying meaning. The learners’ own linguistic resources are not sufficiently activated during the PPP sequence. As Lightbown and Spada (1999) indicate, this may have detrimental effects on their willingness and ability to communicate in real situations:

The classroom emphasis on accuracy often leads learners to feel inhibited and reluctant to take chances in using their knowledge in communication. The results from these studies provide evidence that learners benefit from opportunities for communicative practice in contexts where the emphasis is on understanding and expressing meaning.

(Lightbown & Spada, 1999: 143)

The differences between TBLT and form-focused approaches are summarized by Ellis (2003) as follows:
**Conceptual Framework**

<table>
<thead>
<tr>
<th>Traditional form-focused pedagogy</th>
<th>Task-based pedagogy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigid discourse structure consisting of IRF (initiate-respond-feedback) exchanges</td>
<td>Loose discourse structure consisting of adjacency pairs</td>
</tr>
<tr>
<td>Teacher controls topic development</td>
<td>Students able to control topic development</td>
</tr>
<tr>
<td>Turn-taking is regulated by the teacher</td>
<td>Turn-taking is regulated by the same rules that governs everyday conversation, i.e. speakers can self-select</td>
</tr>
<tr>
<td>Display questions, i.e. questions that the questioner already knows the answer to</td>
<td>Use of referential questions, i.e. questions that the questioner does not know the answer to</td>
</tr>
<tr>
<td>Students are placed in a responding role and consequently perform a limited range of language functions</td>
<td>Students function in both initiating and responding roles and thus perform a wide range of language functions, e.g. asking for and giving information, agreeing and disagreeing, instructing</td>
</tr>
<tr>
<td>Little need or opportunity to negotiate meaning</td>
<td>Opportunities to negotiate meaning when communication problems arise</td>
</tr>
<tr>
<td>Scaffolding directed primarily at enabling students to produce correct sentences</td>
<td>Scaffolding directed primarily at enabling students to say what they want to say</td>
</tr>
<tr>
<td>Form-focused feedback, i.e. the teacher responds implicitly or explicitly to the correctness of the students’ utterances</td>
<td>Content-focused feedback, i.e. the teacher responds to the message content of students’ utterances</td>
</tr>
<tr>
<td>Echoing, i.e. the teacher repeats what a student has said for the benefit of the whole class</td>
<td>Repetition, i.e. a student elects to repeat something another student or the teacher has said as private speech or to establish intersubjectivity</td>
</tr>
</tbody>
</table>

Table 1: Stereotypical classroom processes in traditional form-focused pedagogy and task-based pedagogy (Ellis 2003: 253)

Other characteristics of the task-based curriculum are that “information about learners and, where feasible, from learners will be built into all stages in the curriculum process, from initial planning, through implementation, to assessment and evaluation” (Nunan, 2004: 15). This links TBLT to other language learning concepts, where the learner has a central role to play, such
as learning strategies and learner autonomy (cf. e.g. Benson & Voller, 1997; Little, 1991; Little, Ridley, & Ushioda, 2003; Oxford, 1990; Scharle & Szabó, 2000).

TBLT has a strong basis in applied linguistic theory and empirical research. Its primary roots are in cognitive approaches in SLA, especially in the Interaction Hypothesis (Long, 1983; Pica, 1994). In a discussion of the relevance of the Interaction Hypothesis for task-based language learning and teaching, Ellis (2003) provides the following description:

The Interaction Hypothesis, then, suggests a number of ways in which interaction can contribute to language acquisition. In general terms, it posits that the more opportunities for negotiation (meaning and content) there are, the more likely acquisition is. More specifically, it suggests: (1) that when interactional modifications lead to comprehensible input via the decomposition and segmenting of input acquisition is facilitated; (2) that when learners receive feedback, acquisition is facilitated; and (3) that when learners are pushed to reformulate their own utterances, acquisition is promoted.

(Ellis, 2003: 80)

A key concept associated with the Interaction Hypothesis is ‘focus on form’. The assumption is that language users engaged in meaningful communication may at times experience a breakdown in communication as a result of which the attention to meaning (message) may momentarily shift to the formal properties of the language (code). A good deal of SLA research has gone into what triggers attention to form and how this affects the quality and quantity of language use during communication. Providing attention to form as part of meaningful communication tasks has become one of the central themes in instructed SLA research.

Along similar lines, Ellis (2003) explores the role of sociocultural theory (SCT) in TBLT. His conclusion is that, although the cognitive and sociocultural frameworks are theoretically irreconcilable, “both perspectives offer valid insights into how tasks create the conditions that promote language acquisition” (Ellis, 2003: 201-202). SCT, he argues, has much to contribute to interpreting “task-in-process” aspects of TBLT, i.e. behaviours and processes during task performance that cannot be planned for, distinguishing them from “task-as-workplan” aspects, which are relevant at the time of task design (also cf. Ellis’ definition of task, given above). “From a pedagogic perspective, then, the two research traditions need not be seen as incompatible” (Ellis, 2003: 202). It is mainly in the theoretical load associated with the terms interaction and collaboration and in the divergent interpretations on the origin of knowledge that is generated through dialogue and working together that the two approaches differ. The actual classroom procedures focusing on language learning tasks are largely the same.

These accounts on experiential, social aspects of language learning provide a direct link with the Flexibility-Activity Framework, which we will introduce below to describe other aspects of technology integration (particularly in relation to the environment component of implementation).

It has already been indicated that the primary attention to meaning in TBLT does not mean that formal language properties do not have a place in the task-based curriculum. The Interaction Hypothesis provides the theoretical
basis for focus on form as an important aspect of language learning and “there is now widespread acceptance that a focus on form has a place in the classroom” (Nunan, 2004: 9). Consequently, current text books on TBLT invariably pay attention to how to integrate form into the curriculum. They may differ, however, in just how this is best achieved.

In describing tasks on the principle that focus on meaning precedes focus on form, Willis and Willis (2007) present guidelines in which a “focus on language” (their label for what is commonly called “focus on form”) is always secondary to a focus on meaning. In addition, they allow for explicit attention to structure (grammar, lexis, pronunciation) at the end of the task sequence.\(^1\)

Nunan (2004) proposes a six-step pedagogical sequence for introducing tasks, in which focus on form precedes the carrying out of the task. Formal language aspects are integrated into the framework he proposes by supplementing pedagogical tasks with so-called “enabling skills”, specifically devised to prepare the learner for authentic communication tasks (Nunan, 2004: 22-25).

Ellis (2003) leaves room for a modular approach, in which content and form are not integrated at all, but offered through two separate modules in the syllabus. In view of the principles of TBLT the communicative module is the main module (p. 237). This suggestion is elaborated on in Willis and Willis (2007: 191).

The primary focus on meaning in TBLT, therefore, does not mean that formal language aspects are neglected. There is ample room for attention to grammar, lexis and pronunciation, which can be treated both implicitly through focus-on-form (FoF) and explicitly through focus-on-forms (FoFs)

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\(^1\) This would normally be called “focus on forms” (FoFs) in the Interactionist / TBLT literature (cf. e.g. Norris & Ortega, 2000), but Willis and Willis, somewhat confusingly perhaps, prefer to reserve the term “focus on form” for this type of attention to structural aspects of language (Willis & Willis, 2007: 21-30).
treatments in the curriculum. Methodological design frameworks are available in the TBLT literature for incorporating meaning and form systematically into the language teaching process. We will come back to these frameworks, as we begin to lay out the place for ICT in the TBLT framework in chapter 6.

Quite surprisingly for a contemporary language teaching framework, the role of the computer has been spelled out rather poorly in the literature on TBLT methodology and practice. TBLT seems to be particularly well placed to accommodate the use of computers, which are generally associated with learner-centredness, motivation, authenticity, etc. Undoubtedly, TBLT practitioners have found numerous ways of applying ICT to task-based principles and procedures, but the scant treatment of it in major reference works on TBLT (e.g. Ellis, 2003; Nunan, 2004; Willis, 1996; Willis & Willis, 2007) is remarkable. Since it is our contention that TBLT is a promising avenue for carrying ICT for language learning purposes forward (thereby helping to bridge the potential-practice gap), we will outline some aspects of its present role in TBLT here and develop the topic further in chapters 6 and 7.

Ellis (2003), in spite of the substantial research reported on and the detailed discussion of design and methodology issues, has nothing to say about the role of ICT. Nunan (2004) makes several references to the use of technology (e.g. in the section on tasks that use the community as a resource (p. 72)) and he has been known to be actively involved in the use of ICT for learning-related purposes (e.g. Nunan, 1999), but in his design proposal or the discussion of the components of TBLT no explicit reference is made to the use of technology. Along similar lines, Willis and Willis (2007) mention the use of technology incidentally when describing language learning tasks, but do not suggest a specific role for it in task design. They regard the Internet as a resource for English language learning and the role of email as a medium to be taken into account. Computer-based media are discussed primarily in the context of providing input, an essential component of the task framework. In
addition, technology itself may be a topic for discussion. In this respect, they point to the role of email as a subject for discussion in the classroom (Willis & Willis, 2007: 140), thereby asserting one of the roles the computer has been known to have for language learning (cf. Beatty, 2003: 112-113). Other than providing a resource for input, it looks as if ICT has no clearly defined place in the major TBLT design frameworks.

What most of the suggestions for computer use in TBLT have in common is that they look at how ICT can enhance classroom-based teaching. The classroom sits centre stage in TBLT accounts (possibly quite rightly so), but in order to fully appreciate the potential of ICT for supporting language learning and teaching, it is necessary to re-assess the role of technology in relation to the classroom-based design frameworks in TBLT. It will be argued that ICT has substantially augmented the TBLT playing field and that we should also look beyond the classroom to affirm the true potential of ICT in the face of TBLT principles and practice. This is further substantiated in discussions of ICT-applications by researchers and practitioners working from the heart of TBLT.

Schrooten (2006), in the context of a very interesting large-scale implementation of TBLT in Flanders, discusses the challenges of developing interactive multimedia applications on the basis of TBLT principles. He concludes that the current offering of applications does not meet TBLT standards at all:

"Integrating the use of computers in TBLT is not self-evident, since the principles underlying a lot of currently available educational programs seem to be flatly opposed to the principles of task-based language learning."

(Schrooten, 2006: 130)
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He then reports on software development projects which set out to comply with TBLT principles better. The first program described is a multimedia program for Dutch as a second language (Bonte Wais) which arguably comes a long way to meeting TBLT principles and theory. As a point of reference, Schrooten relates the program features to 10 methodological principles (MPs) of TBLT developed by Doughty and Long (2003) (for more information on these, see below). Although Schrooten argues that “[c]ontrary to popular belief, productive skills can also be developed using computer-based material”, the examples presented make it clear that receptive skills rather than productive skills are being practiced. Students respond to multimedia-based cues in simulated dialogues by choosing one of the possible answers, which through branching lead them into other parts of the dialogue. Learners are given considerable choice, authenticity is in evidence and motivation is no doubt enhanced. So improvements over programs conceived in the “behaviouristic” tradition are unquestionable. But the limitations of the software in realising the full potential of TBLT are obvious. In the context of another program, the author concedes:

The limitations of our multimedia materials (and of most currently available CALL materials for that matter) lie in the interpretation of the learner’s input and the provision of suitable feedback. If the computer does not succeed in interpreting the solutions proposed by the students, this might limit its potential for application in task-based language teaching.

(Schrooten, 2006: 149)

It should be observed, however, that the author is only considering the potential of the computer as tutor (Levy, 1997). He does not talk about the computer as a tool for learning, e.g. in its common function of providing a channel for communication. In addition, he primarily addresses its use in the context of the well-established TBLT classroom. The program was designed in such a way that it would be used by two students at the same time (to
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promote interaction) and to enhance the role of the teacher as facilitator in the classroom: “by introducing the computer in the language classroom, it becomes easier for teachers to concentrate on their facilitating and mediating role, since offering content and organizing the lesson is to a large extent taken over by the computer” (Schrooten, 2006: 149). From the perspective of realising TBLT principles, these are valuable objectives, but from the point of view of implementation, these are definitely not the only options for using ICT in the TBLT classroom. As will be argued further on, rather than putting the task into the software, putting the software into the task should be considered as an alternative.

Also working within the framework of TBLT, Doughty and Long (2003) discuss the use of computers in distance foreign language learning for the less commonly taught languages. In this context, they seek to identify “[w]hich technological advances help create an optimal psycholinguistic environment for language learning, and which may be innovative but relatively unhelpful” (p. 50). To address this issue, they make a useful distinction between Methodological Principles (MPs) on the one hand, and Pedagogic Procedures (PPs) on the other. MPs are “putatively universally desirable instructional design features, motivated by theory and research findings in SLA, educational psychology, and elsewhere, which show them to be either necessary for SLA or facilitative of it” (p. 51). PPs “comprise the potentially infinite range of local options for realizing the principles at classroom level” (p. 53).

Doughty and Long (2003) present the following table to link the MPs to L2 implementation and CALL implementation respectively (i.e. PPs in a local context). They use this as background for discussing the options for realising PPs in a distance learning context.
<table>
<thead>
<tr>
<th>Principles</th>
<th>L2 Implementation</th>
<th>CALL Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTIVITIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MP1</td>
<td>Use tasks, not texts, as the unit of analysis.</td>
<td>task-based language teaching (TBLT); target tasks, pedagogical tasks, task sequencing</td>
</tr>
<tr>
<td>MP2</td>
<td>Promote learning by doing.</td>
<td></td>
</tr>
<tr>
<td><strong>INPUT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MP3</td>
<td>Elaborate input (do not simplify; do not rely solely on &quot;authentic&quot; texts).</td>
<td>negotiation of meaning; interactional modification; elaboration</td>
</tr>
<tr>
<td>MP4</td>
<td>Provide rich (not impoverished) input.</td>
<td>exposure to varied input sources</td>
</tr>
<tr>
<td><strong>LEARNING PROCESSES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MP5</td>
<td>Encourage inductive (&quot;chunk&quot;) learning.</td>
<td>implicit instruction</td>
</tr>
<tr>
<td>MP6</td>
<td>Focus on form.</td>
<td>attention; form-function mapping</td>
</tr>
<tr>
<td>MP7</td>
<td>Provide negative feedback.</td>
<td>feedback on error (e.g., recasts); error &quot;correction&quot;</td>
</tr>
<tr>
<td>MP8</td>
<td>Respect &quot;learner syllabuses&quot;/developmental processes.</td>
<td>timing of pedagogical intervention to developmental readiness</td>
</tr>
<tr>
<td>MP9</td>
<td>Promote cooperative/collaborative learning.</td>
<td>negotiation of meaning; interactional modification</td>
</tr>
<tr>
<td><strong>LEARNERS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MP10</td>
<td>Individualize instruction (according to communicative needs, and psycholinguistically).</td>
<td>needs analysis; consideration of individual differences (e.g., memory and aptitude) and learning strategies</td>
</tr>
</tbody>
</table>

Table 2: Language Teaching Methodological Principles for CALL (from Doughty and Long 2003: 52)

Their perspective is broader than that in Schrooten (2006) above: they also consider what would be referred to as computer-as-tool (Levy, 1997) uses (computer-mediated communication, discussion, corpora and concordancing). But it is evident from the table above that the MPs are primarily linked to tutorial uses of technology: simulations, tutorials,
authoring, design and coding features, response feedback, adaptivity and branching.

They emphasise the importance of teacher mediation and intervention throughout. In discussing MP1 (“Use task, not text, as the unit of analysis”), they question the effectiveness of learner autonomy because learners are not “applied linguists” or “domain experts.” With respect to MP2, they note that simulations are useful for promoting learning by doing, but “in the name of learner control or individualized instruction, learners simply are not given adequate guidance” (p. 59). In relation to MP4 (“Provide Rich Input”), they warn that Internet searches require teacher guidance and intervention. And, on a similar note, that concordancing and text corpora are useful for teachers but not for students. The teacher has a key role to play in providing support for technology use in the classroom.

Providing the same type of support in a distance learning context away from the traditional classroom poses severe limitations to asserting this crucial role of the teacher:

Still, where language teaching takes place entirely out of the classroom, this is not without difficulty. For instance, the classroom teacher – who is … (a) ordinarily the most reliable source on local circumstances, (b) the one who can best make decisions as the lesson unfolds, and (c) a major source of native L2 input and feedback on error – is now removed in space and time from the learners, who may, in turn be removed from one another.

(Doughty & Long, 2003: 53)

Distance language learning, they argue, cannot make up for the absence of the teacher and the language classroom. This is a useful reminder that the setting that our study is focusing on does not have the classroom removed from its typical attributes. This will obviously allow for a different allocation of
resources than a full distance education language course would be able to provide.

Another observation is that Doughty and Long (2003) are much more reserved about the potential of computer-mediated communication (CMC) for realising interaction-based MPs than several interaction-based CMC studies would seem to warrant (Blake, 2000; Pelletieri, 1999; Kitade, 2000; Leahy, 2004; Sotillo, 2000; Toyoda & Harrison, 2002; Tudini, 2003). Significantly, Doughty and Long (2003) do not mention CMC as one of the CALL implementations for MP6 (“Focus on form”) and MP7 (“Provide negative feedback”), where much interaction-based CMC research would have placed it. They argue that opportunity for more interaction does not always mean better interaction. But they do not reject the usefulness of CMC for language learning in the distance learning context altogether. Citing Salaberry (2000), they state:

> On the other hand, if learners participate in CMC discussion with one conversational partner, the interaction is very much like that observed in SLA research on negotiation, particularly if task goals are clear.  
> (Doughty & Long, 2003: 61)

In another critical assessment of the role of ICT in TBLT, Skehan (2003) downright rejects a tutorial role of technology. His perception of the weakness of computers is similar to that voiced by Doughty and Long (2003), when he claims that “the computer would lack the intelligence of the classroom teacher to make adaptations and appropriate pedagogic decisions” (Skehan, 2003: 402). Like most TBLT researchers and practitioners, he finds that the main strength of technology is in its capacity to provide input for language learning:

> What is really exciting about the use of technology is its potential as a source of language learning materials and input. And in that respect,
the major change in the last 5-10 years has been the emergence of the web as a colossal language-materials resource. On occasions, this may consist of resources which have been put together specifically for language learners. But the vast majority of the materials exist for other purposes, and are simply there with potential to be exploited.

(Skehan, 2003: 403)

Skehan (2003) provides several examples of web resources that might be used, mentioning that audio-visual materials and CMC with native speakers (which are part of these input resources) may greatly enhance language learning. Language learning projects might be one way for TBLT pedagogies to build on this potential.

Crucial to his argument, however, is his point that mere exposure to input is not sufficient and that language development must be targeted by setting up tasks grounded in TBLT and SLA research. In particular, there should be the capability for learners “to focus on form, to notice features of language, and then develop and consolidate features of language which have been noticed” (Skehan, 2003: 404). Language development (both learning to do new things, and learning to do things better) could be promoted by pre-task planning and, especially by post-task activities. The location of choice for such activities, he argues, would be the classroom, thereby affirming the central role of the classroom and, as a corollary, the classroom teacher in TBLT research and practice. An interesting aspect of the article is that Skehan also makes suggestions for the development of software in the context described. We will come back to this in chapter 6.

It is interesting to see how, in putting theory to practice when bringing courses online, teacher-designers working from TBLT principles prioritise different aspects of technology. This is evident from three Internet-based TBLT courses described in Leaver and Willis (2004). Antokhin et al. (2004) describe a sophisticated tailor-made web environment, which comprises
several of the tutorial functions rejected by Skehan above, with CMC added for online interaction. Stevens (2004) uses generally available technology, particularly for CMC, to provide a platform and additional functionality for an online community of learners focusing on writing tasks. Finally, Lys (2004) describes a web-based extension of an on-campus writing course, in which students primarily use the web for expressing themselves in writing and for access to online resources which may make them write better.

These examples, to which we will come back later, may shed more light on the critical aspects of technology use in a TBLT context introduced above, such as the role of the classroom and the classroom teacher, and the views on ICT in its functions of tutor, tool or resource.

In fact, many other CALL applications, also those not explicitly associated with the TBLT framework, can be used to highlight additional aspects of the use of technology in a TBLT context. Taking the TBLT framework as our primary orientation for language pedagogy allows us to specify how and where these applications might be integrated in language instruction. We will explore this issue further by considering the framework in relation to the dimensions which ICT may add to the language learning environment. The learning environment is obviously extended beyond the traditional classroom limits, but not necessarily stretched to full distance learning proportions. The distribution of task-based learning activities in this environment is likely to be critical to their success.

2.4.1 Relevance of TBLT for IILL implementation

In sum then, TBLT helps us to focus on the following aspects of developing an implementation framework for IILL:

- Assessing which connections are possible between current implementation frameworks for TBLT and the use of technology;
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- Establishing the role(s) of technology in relation to students enacting (semi-) authentic tasks;

- Using technology to keep a primary focus on meaning, while allowing for secondary attention to focus on form or focus on forms;

- Exploring the role of the classroom and classroom teacher in relation to the use of technology;

- Considering the relationship between in-class and out-of-class activities and the use of technology;

- Identifying if ICT has more to offer TBLT than its role as a resource for input;

- Addressing the cognitive and social aspects of interaction and collaboration supported by ICT;

- Examining if and how CMC may provide an alternative for interaction in the classroom;

- Investigating if and how tutorial applications of ICT can be accommodated in the TBLT framework;

- Determining whether ICT should be conceived of as part of the task (sequence) or the task (sequence) part of ICT.

Several aspects listed are interrelated, addressing the same problem from different angles. In discussing these aspects later on in this study, the argument will look at each from the point of view of pedagogy, technology and educational environment and how these may be aligned to realise IILL based on TBLT principles and methodology.
2.5 CEFR

An additional perspective on the role of ICT in the TBLT context is provided by the Common European Framework of Reference for Languages (CEFR), which is currently acting as one of the drivers of innovation in language learning and teaching across Europe. A description of what the CEFR purports to be can be found on the first page of the document:

The Common European Framework provides a common basis for the elaboration of language syllabuses, curriculum guidelines, examinations, textbooks, etc. across Europe. It describes in a comprehensive way what language learners have to do in order to use a language for communication and what knowledge and skills they have to develop so as to be able to act effectively. The description also covers the cultural context in which language is set. The framework also defines levels of proficiency which allow learners’ progress to be measured at each stage of learning and on a life-long basis.

(Council of Europe, 2001: 1)

Many educational institutions, publishers and testing institutes across Europe are currently revising language learning and teaching practices to adapt to the CEFR guidelines. National education policies are following suit. This makes the CEFR a force to be reckoned with in the environmental dimension of the intended implementation framework.

Although claiming not to “embody any one particular approach to language teaching to the exclusion of others” (Council of Europe, 2001: 18), the CEFR is a political offshoot of the TBLT framework outlined above. This is evident from a full chapter on “Tasks and their role in language teaching” (Council of Europe, 2001: chapter 7, pp. 157-167), and from descriptions such as the following: “Communication and learning involve the performance of tasks which are not solely language tasks even though they involve language
activities and make demands upon the individual's communicative competence” (p. 15).

Researchers working within the field of TBLT (e.g. Nunan, 2004; Willis & Willis, 2007) have acknowledged the relevance of the CEFR for TBLT, particularly in relation to proficiency levels and learner outcomes. Although taking exception with the framework on a number of points, Willis and Willis (2007) align the CEFR with the TBLT framework to provide a basis for curriculum design. This leads them to the following claim:

So far, we have shown that by working carefully with an inventory like that provided by the CEF it is possible to design a series of tasks to provide learners with the communicative experience they will need to use the language effectively outside the classroom.

(Willis & Willis, 2007: 186)

Nunan (2004) also suggests that the CEFR may be an important ‘point of departure’ for TBLT syllabus design. Other candidates for serving similar functions in different contexts might be the ACTFL Proficiency Guidelines (Murphy-Judy & Youngs, 2006: 47), the Canadian Language Benchmarks (Willis & Willis, 2007: 181) and the TESOL standards (Nunan, 2004: 46-47). Working from a European perspective, we will primarily use the CEFR as our frame of reference for discussing the relevant aspects of competency-based approaches to language learning and teaching.

The traditional distinction between listening, reading, speaking and writing skills is arranged differently by the CEFR on the basis of a division between receptive, productive and interactive ‘language activities’, supplemented by an additional activity under the heading of ‘mediation’. The actual descriptions used, together with more traditional denominators of the activities involved, are given in Table 3 below:
Most relevant to our purposes is the distinction between productive and interactive language activities (‘oral production’ vs. ‘oral interaction’ and ‘written production’ vs. ‘written interaction’). This distinction is based on a difference between transactional and interactional uses of language which is described by Ellis (2003), citing Brown and Yule (1983), as follows:

Brown and Yule (1983) characterize communication as involving two general purposes – the interactional function, where language is used to establish and maintain contact, and the transactional function, where language is used referentially to exchange information.

(Ellis, 2003: 27)

The distinction is highly relevant since oral production and oral interaction make different demands on learner resources and are associated with different technology applications. Technology-supported interactive uses are, for instance, particularly associated with CMC, where distinctions between speaking and writing may get blurred. This was noted by Willis and Willis (2007) in one of their few comments on the use of technology. Discussing the
differences between transaction and interaction in the context of speaking and writing, they observe:

These are useful distinctions and account for many of the differences between spoken and written language, but it is a mistake to think that the distinction between spoken and written language is entirely clear cut. For example email chat [sic] has a lot in common with the spoken language and is used in everyday conversation, whereas a university lecture has a lot in common with the language of a textbook.

(Willis & Willis, 2007: 57)

A key difference between interactive and productive language activities is related to the task parameter of ‘planning time’. Extending planning time may benefit linguistic accuracy, while restricting it may enhance fluency (e.g. Samuda & Bygate, 2008; Skehan, 2003). The choice of technology may affect this aspect of language learning. Text-based synchronous CMC (SCMC), commonly known as chatting, for instance, approximates oral interaction but generally allows more time for planning. It therefore provides one of the technology options for manipulating the planning parameter in the language learning process.

The CEFR distinction between spoken/written production and spoken/written interaction helps us to express the relevant aspects better than the more global, traditional labels ‘speaking’ and ‘writing’ would have allowed us to do. In the following chapters, we will explore further links between the ‘language activities’ defined by the CEFR (with the exception of ‘mediation’) and the use of technology. The potential of technology is highly dependent on the particular skill targeted. The CEFR helps us to outline the relevant skills and competencies, not as skills to be taught discretely but to provide a framework for articulating the affordances of technology relative to the skills at hand.
As Murphy-Judy and Youngs (2006) point out, the CEFR has “many references to new media and technologies” and the CEFR calls upon teachers to consider how to make use of instructional media as methodological options for language learning and teaching (Murphy-Judy & Youngs, 2006: 56-58, referring to CEF, sections 4.4.3.2, 4.4.3.3, 4.3.3.4 and 6.4.2.4)). In addition, the CEFR has given rise to development of software specifically designed on the basis of CEFR principles and objectives. The best known of these is DIALANG (http://www.dialang.org), a self-assessment program available in 14 European languages. More recent developments are in the area of electronic versions of the European Language Portfolio, while other programs are also available claiming some form of association with the Framework. In discussing the options for supporting TBLT by means of technology, we shall also make reference to the use of these programs.

2.5.1 Relevance of CEFR for IILL implementation

The CEFR offers a valuable extension to the TBLT framework by focusing attention on the following aspects relevant for implementing IILL:

- Dealing with the CEFR as one of the agents of change in the educational environment;

- Linking TBLT with an outcome-based framework of reference as the basis for instructional design and exploring the use of technology in that context, particularly for purposes of assessment;

- Exploring the potential of technology in relation to each of the receptive, productive and interactive language activities distinguished by the CEFR,\(^2\)

\(^2\) In this study, no further attention will be paid to language activities belonging to the rubric of “mediation”.

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• Using technology in the context of carrying out communicative activities as defined by the CEFR;

• Assessing the use of computer programs designed on the basis of principles from the CEFR.

TBLT and CEFR together provide a broad conceptual basis which allows us to assess how technology may be deployed in a contemporary language learning environment, where tasks are central to language learning and where proficiency can be assessed by reference to a widely accepted inventory of linguistic descriptors.

2.6 Flexibility-Activity Framework

The third and final framework of reference for this study is the Flexibility-Activity Framework described in Collis and Moonen (2001). It is particularly useful for interpreting the environmental dimension of ILL, although it also has much to say about the technology-pedagogy interface. The Flexibility-Activity Framework is a general, non-linguistic framework focusing on the use of ICT in Higher Education. It is based on the premise that computer technology is particularly useful for enhancing flexibility for the learner. More specifically, the Flexibility-Activity Framework distinguishes four key components for flexible, ICT-supported learning in Higher Education. These are technology, pedagogy, implementation and institution respectively. The interdependency of the four components is illustrated in the following diagram:
Collis and Moonen (2001: 18-28) provide a description of what each of these components entails:

2.6.1 Technology

Technology is used synonymously with computer technology (hardware) and computer technology applications (software), which may be used for teaching and learning. Collis and Moonen’s concept of technology corresponds to our definition of Information and Communication Technology presented above.

2.6.2 Pedagogy

This term is used to “indicate the manner in which the teaching and learning processes and settings in a course are organized and implemented by the instructor” (p. 19). A distinction is made between “pedagogical approach” and “pedagogical model”. Pedagogical approach is defined in terms of the components used for the course and the pedagogical activities involved, such as general course organisation, lectures, self-study, major assignments, testing
and communication. Pedagogical model refers to the theoretical foundation, the concepts and principles upon which the approach is built.

From a pedagogical point of view, Collis and Moonen (2001) associate the need for increased flexibility particularly with the desire to give students a more active role in the learning process. This is the essence of the Flexibility-Activity Framework, which can be applied to gradually introduce more flexible, participation- and contribution-oriented forms of learning. Collis and Moonen (2001) represent the key dimensions of the Flexibility-Activity Framework as follows:

The underlying rationale is that teaching is often acquisition-oriented and inflexible (i.e. situated in Quadrant I in Figure 3 above) and should strive to become more flexible and participation- or contribution-oriented (i.e. move towards Quadrant IV). The theoretical underpinnings for this point of view

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3 I.e. focused on students contributing to learning materials which may be used for subsequent learning.
are due to Sfard (1998), who identified two basic models for education, the Acquisition Model and the Participation Model. The Acquisition Model relates to learning activities focused on the acquisition of predetermined knowledge and concepts, whereas the Participation Model refers to learning focused on apprenticeship and becoming a member of a community of practice. Both models, Sfard argues, are needed in Higher Education. The differences between the two models are summed up by Collis and Moonen (citing Sfard 1998: 5-7) as follows:

<table>
<thead>
<tr>
<th></th>
<th>Acquisition</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key definition of learning</td>
<td>Learning as knowledge acquisition and concept development; having obtained knowledge and made it one's own; individualized.</td>
<td>Learning as participation, the process of becoming a member of a community, ‘the ability to communicate in the language of this community and act according to its norms’; ‘the permanence of having gives way to the constant flux of doing’.</td>
</tr>
<tr>
<td>Key words</td>
<td>Knowledge, concept, misconception, meaning, fact, contents, acquisition, construction, internalization, transmission, attainment, accumulation.</td>
<td>Apprenticeship, situatedness, contextuality, cultural embeddedness, discourse, communication, social constructivism, co-operative learning.</td>
</tr>
<tr>
<td>Stress on</td>
<td>‘The individual mind and what goes into it’; the ‘inward’ movement of knowledge.</td>
<td>‘The evolving bonds between the individual and others’; ‘the dialectic nature of the learning interaction: The whole and the parts inform each other’.</td>
</tr>
<tr>
<td>Ideal</td>
<td>Individualized learning.</td>
<td>Mutuality; community building.</td>
</tr>
<tr>
<td>Role of instructor</td>
<td>Delivering, conveying, facilitating, clarifying.</td>
<td>Facilitator, mentor, ‘expert participant, preserver of practice/discourse’.</td>
</tr>
<tr>
<td>Nature of knowing</td>
<td>Having, possessing.</td>
<td>Belonging, participating, communicating.</td>
</tr>
</tbody>
</table>

Table 4: Comparison of the Acquisition and Participation Models, based on Collis and Moonen (2001: 22)
They concur with Sfard that learning in Higher Education must include aspects of both the acquisition model and the participation model. The relationship between pedagogy and flexibility forms the basis of the Flexibility-Activity Framework, which will be used as a reference throughout this study.

### 2.6.3 Implementation

This concerns the actual implementation of technology in educational institutions. Pedagogical theories must be applied and technologies used. In the Flexibility-Activity Framework, implementation, which mediates between technology and pedagogy on the one hand and institutional environment on the other, is the component for describing which strategies and actions are most likely to contribute to successful integration of technology. Particular reference is made to a model for predicting acceptance of technology for learning-related purposes, the so-called 4-E Model, which posits that “the individual’s likelihood of making use of technological innovation” (p. 25) crucially depends on the following four factors:

- **Environment**: the institutional context;
- **Educational Effectiveness**: the perceived or expected effectiveness;
- **Ease of use**: how difficult or easy it is to use a particular program;
- **Personal Engagement**: how individuals respond to technology and change;

The underlined Es represent the key factors of the 4-E Model.

### 2.6.4 Institution

The institutional framework concerns factors beyond the level of individual courses or study programmes. It includes elements such as vision on learning and teaching, social and educational climate, institutional support structures.
and infrastructure. It may also concern the wider national or international context in which educational institutions operate.

The diagram represents the institutional framework as the outermost dimension, since it incorporates all the other elements relevant for creating flexible learning by means of technology. This opens up the perspective of discussing implementation in terms of top-down versus bottom-up approaches.

2.6.5 Interrelationship between component elements

A crucial aspect of the four components of the technology-enhanced learning environment is that they are interdependent. The interrelationship is not unidirectional. As was pointed out above, the introduction of technology normally requires changes in the organisation of the institutional environment. Conversely, decisions on changing the organisation of the institution may require the adoption of new technologies. In the same fashion, institutions, e.g. acting on national or international initiatives, may feel the need to adopt innovative pedagogies affecting the organisation of teaching and learning in the institution as a whole. These may impact on existing pedagogical practices at the level of specific disciplines (such as languages), reinforcing or weakening them, whatever the situation may be. The interrelationship between the constituent elements of the flexible, ICT-supported learning environment is extremely complex. Implementation will have to respond to initiatives, activities, policies, organisational cultures and structures at the each of the respective layers of the organisation while keeping an eye on possible repercussions at the other layers.

To assist those involved in the implementation process, Collis and Moonen have developed a set of 18 lessons learnt, which they apply consistently in describing the process of technology integration in HE institutions. Since many of these lessons are also appropriate to language learning, the entire list of the lessons is given below.
### Lesson 1 Be specific.
We need to define our terms and express our goals in a measurable form or else progress will be difficult to steer and success difficult to claim.

### Lesson 2 Move from student to professional.
Learning in higher education is not only a knowledge-acquisition process but also a process of gradual participation in and contribution to the professional community. Pedagogy should reflect both acquisition and contribution-oriented models.

### Lesson 3 You can’t not do it.
The idea whose time has come is irresistible.

### Lesson 4 Don’t forget the road map.
Change takes a long time and is an iterative process, evolving in ways that are often not anticipated.

### Lesson 5 Watch the 4 Es.
An individual’s likelihood of voluntarily making use of a particular type of technology for a learning-related purpose is a function of the 4Es: the environment context, the individual’s perception of educational effectiveness, ease of use, and the individual’s sense of personal engagement with the technology. The environmental context and the individual’s sense of personal engagement are the most important.

### Lesson 6 Follow the leader.
Key persons are critical.

### Lesson 7 Be just in time.
Staff-engagement activities to stimulate instructors to make use of technology are not generally very effective. Focus on just-in-time support for necessary tasks.

### Lesson 8 Get out of the niche.
Most technology products are not used in practice beyond developers. Keep implementation and the 4 Es central in choosing any technology product.

### Lesson 9 After the core, choose more.
Technology selection involves a core and complementary technologies. The core is usually determined by history and circumstances; changing it usually requires pervasive contextual pressure. The individual instructor can make choices about complementary technologies and should choose them with flexibility in mind.

### Lesson 10 Don’t overload.
More is not necessarily better.

### Lesson 11 Offer something for everyone.
A well-designed WWW-based system should offer users a large variety of possibilities to support flexible and contribution-oriented learning not dominated by any one background orientation. If so, it is the most appropriate (core or complementary) technology for flexible learning.

### Lesson 12 Watch the speed limit.
Don’t try to change too much at the same time. Start where the instructor is at, and introduce flexibility via extending contact sessions to include before, during and after aspects, with each of these made more flexible. Move gradually into contribution.
Lesson 13 Process yields product. Through the process of contribution-oriented learning activities, learners themselves help produce the learning materials for the course.

Lesson 14 Aim for activity. The key roles of the instructor are becoming those of activity planning, monitoring and quality control.

Lesson 15 Design for activity. Instructional design should concentrate more on activities and processes, and less on content and a predetermined product.

Lesson 16 Get a new measuring stick. What we are most interested in regarding learning as a consequence of using technology often can’t be measured in the short term or without different approaches to measurement. Measure is what can be measured, such as short-term gains in efficiency or increases in flexibility.

Lesson 17 Be aware of the price tag. It is not going to save time or money to use technology, at least not in the short term.

Lesson 18 Play the odds. A simplified approach to predicting return on investment (ROI) that looks at the perceived amount of relative change in the factors that matter most to different actors is a useful approach.

| Table 5: The lessons learnt, based on Collis and Moonen (2001: 2-3) |

Reference will be made to these lessons at several points in the discussion of actual and potential uses of technology in language pedagogy in the institutional context, in the next chapters.

2.6.6 Relevance of the Flexibility-Activity Framework for IILL implementation

The Flexibility-Activity Framework is particularly relevant as a basis for developing an implementation framework for IILL by:

- Presenting a pedagogically motivated, holistic view on the implementation of technology for learning-related purposes in general;
Consistently addressing four key components (technology, pedagogy, implementation, institution) when considering options for technology use in the educational context;

- Adopting a pedagogical model distinguishing between acquisition aspects and participation aspects of learning, which is also relevant to language learning (and has in fact been explored in that context, see Pavlenko and Lantolf (2005));

- Identifying the 4 Es (Institutional Environment, Educational Effectiveness, Ease of Use, Personal Engagement) that research has shown to have the greatest impact on the acceptance of technology for learning-related purposes;

- Offering a set of lessons learnt relevant for the implementation of technology for learning-related purposes, which may be helpful in determining implementation scenarios for IILL.

The Flexibility-Activity Framework has been developed on the basis of experience and empirical research findings, which makes it a good candidate for interpreting aspects of implementation that are sometimes beyond the scope of language studies proper. In addition, the pedagogical basis provided helps to interpret language learning in the wider context of university-based education.

2.7 Implementation model for IILL

In this chapter IILL has been defined and the pedagogical frameworks that focus our concept of implementation of IILL have been introduced. The core components of integration that implementation must address are compatible with the key components of flexible learning identified by Collis and Moonen. But rather than using their model for describing IILL implementation, an alternative implementation model for IILL is presented here (Figure 4 below).
The core elements of integration, pedagogy, technology and environment, introduced in section 2.2 and Figure 1 above are represented as triangles in this model, with implementation as “the acts or processes of combining pedagogy, technology and environment so that they work together” added as an inverted triangle combining each of these. This model expresses the mediating role of implementation in relation to each of the other elements more strongly. Of course, it can also be used for implementation in disciplines other than languages, which makes it possible to explore potential connections in terms of any of the component parts or combinations of these.

The emphasis in this study will be on applying the conceptual framework and the proposed model of implementation to the potential and practice of ICT from a contemporary pedagogical and technological perspective. But first, the next chapter will describe at some length the implementation of ICT in ‘language learning’ approximately 15 years ago. This concerns the implementation of Hologram, a program which is still used at some Dutch
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universities today. This program and the way in which it was set up was chosen as an example, because it puts a face on implementation in view of pedagogy, technology and environment and helps to sharpen our focus of contemporary learning environments, which are in many respects more complex than learning environments 10 to 15 years ago.