THE ACQUISITION OF INFLECTIONAL VERB MORPHOLOGY THROUGH
INPUT ENHANCEMENT

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Abstract

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Research suggests that language learners taught with the Communicative Language Teaching (CLT) approach tend to have trouble acquiring semantically less salient grammatical forms such as subject-verb agreement and past-tense markers. This paper describes an experiment in input enhancement which compares which of two sets of materials are better at teaching the past tense form of Spanish: Traditional CLT-compatible grammar materials, or input-enhanced software material in the form of a computer game. Forty-four high school learners participated in the experiment and test results indicated that participants of both instructional groups increased significantly in their ability to apply the target form correctly on three different test tasks. However, inter-groups differences were not statistically significant. It is concluded that computer games using input enhanced material are a valuable addition to the CLT curriculum. Recommendations for their inclusion are made as well as suggestions for future research on this topic.

Marmo Soemarmo

Approved
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Introduction

Among the available theoretical approaches to Second Language Instruction (SLI), Communicative Language Teaching (CLT) is today widely adopted in various forms throughout many of the world’s language teaching settings. Indeed, it has become the dominant pedagogical approach within the professional literature. Many scholars and practitioners have advocated or adopted an indirect, implicit approach to CLT. An example of this is Krashen’s (1983) Natural Approach in which students were expected to slowly grasp the grammar of a language by being exposed to comprehensible input and not receiving any explicit instruction in grammar.

However, there are various problems with taking such an indirect approach and Celce-Murcia, Dörnyei & Thurrell (1997) point out that there is increasing debate as to “the pedagogical treatment of linguistic forms in CLT” (p. 142). Several scholars have leveled critique at this point (e.g., Celce-Murcia, 1991; Dörnyei & Thurrell, 1991, 1992; Kumaravadivelu, 1992, 1993; Larsen-Freeman, 1990).

Celce-Murcia et al. (1997) state that CLT grew out of the acknowledgement that previous methods “did not adequately prepare learners for the effective and appropriate use of language in natural communication” (p. 144). Subsequently, many aspects of previous methods, such as the drills and pattern practice of Audiolingualism, were largely dismissed by a majority of scholars. Dismissing many of these as less than optimal for developing communicative competence was probably warranted, but in some cases the babies might have been thrown out with the bath water.
As a consequence of this and other points of critique a number of scholars have, during the last decade, adopted a more eclectic approach to CLT. More specifically, there is a growing belief that a direct approach to CLT may be more effective than the “original indirect practice of CLT” (Celce-Murcia et al., 1997: p. 148), which, for example, Krashen (1983) is a proponent of. This approach attempts to lead learners “to acquire communicative skills incidentally by seeking situational meaning” (Schmidt, 1991 – quoted in Celce-Murcia, Dörnyei & Thurrell (1997: p. 141)). In comparison, characteristic of a direct approach is, in addition to communicative tasks, teacher formulaic speech, a focus on form, a promotion of language awareness and consciousness-raising as well as explicit instruction.

These recent changes and the critique that has been leveled at CLT have prompted researchers to seek a deeper understanding of the processes going on within the language learner. This knowledge would help discover where in the language learning process intervention might be most beneficial. Ellis’ (1998) model, depicted in Figure 1, shows a computational metaphor for the processes that take place in second language learning, especially with regard to learning the rules and grammar of the L2. “L2 learners are viewed as intelligent machines that process input in a mental black box. This contains wired-in or previously acquired mechanisms that enable learners to internalize new knowledge for use in input tasks” (Ellis, 1998; p. 42). He considers this model, from input on the left to negative feedback on the right, a computational model of second language acquisition. Instruction can intervene in the process at several points, often creating different outcomes.
Ellis’ (1998) model identifies four distinct places of intervention:

Figure 1: A Computational Model of L2 Acquisition (From Ellis, 1998)

Addressing the *input* stage with specially contrived material is *structured input* (VanPatten, 1993), and working directly upon the *interlanguage system* by using *metalinguage* to explain the rules of the L2 is referred to as *explicit instruction*. Creating opportunities for learners to practice producing a specific target structure is *production practice*, and lastly, *negative feedback* entails presenting the learners with negative evidence by way of pointing out whenever they make errors and possibly also providing corrections. Ellis (1998) points out that form-focused (e.g. grammar) lessons typically involve combinations of these different options because teachers find this the most successful.

Ellis (1997) points out that in today’s classrooms with their predominant focus on communication and conversation practice the input supplied to students is impoverished with regard to grammatical morphemes. What happens is that the current focus on
the communication of meaning (Focus on Meaning) causes semantically less salient aspects of language such as subject-verb agreement and morphological past-tense markers to escape the learners’ attention. Instead, several scholars believe that focusing on the input stage in the teaching of grammar might be more beneficial (see e.g. Ellis, 1997, 1998; Celce-Murcia et al., 1997; Fotos, 1994; Sharwood Smith, 1991).

One of these scholars, Sharwood Smith (1991, 1993) suggests using enhanced input in the teaching of grammatical forms. He posits that by making the targeted grammatical forms stand out in the input learners will notice them and be able to form their own rules for how to apply these forms. What he is thus advocating is in effect a Focus on Forms approach in which there is minimal coupling of grammatical forms and meaning. This contrasts with the Focus on Form approach advocated by e.g. VanPatten & Oikkenon (1996) in which materials are designed to aid the learner’s coupling of grammatical form and meaning. Ellis (1999) states that few studies have explicitly examined the effect of enhanced input upon learning, but concludes that this kind of form-focused instruction works best with grammatically simple structures. Thus, in order to try to determine whether enhanced input is useful for addressing the above mentioned problems my study will compare two different kinds of materials for teaching the past tense inflectional morphemes of Spanish. One set of materials will employ enhanced input while the other set will focus on teaching the same form through materials that promote the negotiation of meaning and communication practice. The input enhanced material will be delivered by computers in the form of a game. The material focusing on communicative practice will be taught in a more conventional way in a teacher-fronted lesson. It is my
belief that the introduction of computers in language teaching has opened up new avenues which may prove fruitful in combination with many already established methods.

**Statement of problem**

Research conducted within the last decade has revealed that students are having trouble learning grammar within a methodological framework that focuses overwhelmingly on the communication of meaning (Ellis, 1997, 1998; Celce-Murcia, 1991; Dörnyei & Thurrell, 1991, 1992; Kumaravadivelu, 1992, 1993; Larsen-Freeman, 1990). More specifically, the finer aspects of inflectional morphology such as subject-verb agreement and past tense markers are notable problematic areas for learners of all proficiency levels. This means that while we must agree that the communication of meaning is the primary goal of language learning it is not sufficient to only focus on this. Evidently, language teachers use eclectic approaches to teaching and do not focus on communication all the time, but exactly what they do is not very well documented and based on personal preferences, level of methodological knowledge, the composition of the particular class and the availability of materials, just to mention a few. What this means is that even if teachers do not focus exclusively on meaning-centered activities, there is no sure way of telling exactly what does help. Evidently, without a systematic approach in which clearly defined instructional methods and materials are compared in a controlled environment there is no telling exactly what works, nor how we may most effectively improve the teaching of these inflectional morphological forms. Thus, both theorists and practitioners within the area of CLT and language instruction in general will benefit from an investigation of
this problem. Such an investigation should not only seek to determine which instructional methods are most effective but also how theory and practice may be linked; that is, make useful recommendations to the practitioners in the field about which materials work and in which way.

**Purpose and Research Questions**

The purpose of this study is to investigate if the inflectional morphology of the Spanish past tense may be taught effectively with computer software that employs enhanced input. By comparing this approach to that of a meaning-centered one which focuses on communication, as is commonly employed in today’s CLT classrooms, we should be able to make recommendations to the theorists in the field. The enhanced input material is in the form of a computer program which further enables us to make comparisons between teacher-controlled and machine-controlled practice. While this comparison is not the primary aim of this study it should enable us to also make some recommendations to the practitioners in the field as to how they may teach this subject in the most effective and fastest way, and make it possible for them to free up more time for genuine classroom communication of meaning. This results in the following research questions:

1. How does the use of computer software that employs enhanced input and an inductive approach to grammar teaching affect learners’ retention and production of the targeted morphological forms as compared to paper-based, CLT-compatible grammar materials and exercises with an indirect focus on grammar through
meaning-centered communication practice? This effect will be investigated in relation to the following tasks:

A. Grammaticality judgment

B. Automaticity

C. Verb conjugation

Corollary question:

1.1: Are the positive effects of the input enhanced software material seen in all three tasks?

2. What is the effect of the input enhanced software material in terms of improving participant memorization and recall of the targeted forms on a timed, contextualized task as compared to CLT-compatible materials that center on communicative practice and meaning?

Corollary question:

2.1: How may input enhanced software material most effectively be integrated into the CLT curriculum?
Limitations of this study

A number of limitations apply to my study. These can be divided into those of a theoretical nature and those of a practical nature.

In terms of theory it is imperative that the reader realizes that my study takes an approach based on second language learning theories and pedagogical theories. Therefore, the reader should not expect to find a lot of sources surveying the application of computer assisted language learning (CALL) as the basis for this study. This is not to say that there are no relevant studies within this area that can inform my study. In fact, several are used. However, and extensive search for relevant literature did not bring up any CALL studies relevant to the core of my study, that is the second language learning theories and methods I employ.

The number of practical limitations of this study is somewhat greater. One that in particular impeded on my study was the unavailability of participants. Five modern language departments in three different American universities declined to participate citing various practical problems, most often relating to a lack of classroom time to be spared for data collection. However, more than one program supervisor also questioned the theoretical basis of the research, labeling the experimental treatment as too decontextualized and criticizing its lack of meaning-centeredness. The consequences of this are discussed in the Conclusion.

Another limitation similar to the one above concerns the quality and availability of equipment. While most institutions had adequate equipment it was only available at limited times and in the end a compromise had to be made between availability and qual-
ity of delivery. In practice, this meant that the volume of the sound on the computers running the experimental software was very low, which affected the auditory component of the software and probably caused some annoyance for the participants.

On the issue of annoyance the software used for this experiment, which was programmed exclusively by the researcher using Macromedia Authorware 3.5, also turned out to have some programming bugs causing some of the participants to have to terminate some of their playing sessions and restarting the program without recording their score and other statistical program data. While this did not seem to cause any major concern for the participants it had a potential impact on the internal and external motivational factors by preventing students from comparing high scores and which level they had reached. It also prevented the researcher from using the reduced amount of data collected this way to make any inferences about participant performance on tests compared to performance on the software.

The last factor that should to be mentioned here is the lack of time available with the participants. The allotted class time of the participating Spanish classes forced the researcher to omit a second posttest and have only one instructional period after which the participants were tested, rather than two, each followed by a test. This limitation prevented, for example, a measure of the effect of practice over time.
Review of the literature

Since this research touches upon several aspects of language teaching methodology and theory it has been necessary to divide the review of literature into separate sections. First, the issue of CLT and the Issue of Input is discussed, after which Computer-based Pedagogy is dealt with. This is followed by an overview of the use of computers within linguistic and psycholinguistic studies as well as for language teaching purposes. The discussion is rounded off with some observations regarding the use of games within language teaching.

CLT and the Issue of Input

The issue of the role and form of input in language teaching is still debated by scholars (see e.g. Ellis, 1999, 1998, 1997; Robinson, 1997; Celce-Murcia et al., 1997; VanPatten & Oikkenon, 1996; Fotos, 1994; VanPatten & Cadierno, 1993). These scholars point to the advantages of conscious focus on grammatical form in language instruction, but, consistent with CLT theory, maintain minimalist positions regarding the amount of explicit instruction that should be delivered in the classroom. They also advocate the predominant use of activities in which learners’ attention is focused primarily (though not exclusively) on meaning.

In his discussion of classroom communication and the acquisition of L2 grammar Ellis (1997), in a review of several studies that investigated the learning of English and French, claims that pure communication without conscious focus on grammar is not
successful in teaching learners several aspects of a second language. He says that, “it is
difficult, for example, to see how the inflectional properties of grammar that are com-
municatively redundant (e.g. third-person –s in English) are…acquired” (Ellis 1997, p.
50). He goes on to state that researchers have found that even advanced learners of Eng-
lish have problems with “such areas of grammar as plural formation, tense inflections,
determiners and prepositions…” (Ibid.). That is not to say that this is only the case for
English, his discussion covers L2 teaching in general. He attributes these problems to the
following features of CLT classrooms: a) the input learners receive is impoverished, b)
they often resort to using their L1, at least at the beginning stages, and c) the opportuni-
ties for certain kinds of output are limited. To this list we might add that beginning learn-
ers, which is what my study will deal with, often focus more on understanding the
message than paying attention to the linguistic forms used and that learners may fossilize
at a stage in which finer aspects of the L2, such as inflectional morphological endings,
are only learned at a level sufficient enough to ensure the relative accuracy of meaning
but not grammatical accuracy. Considering that the above characteristics of the language
learning classroom are virtually universal, it seems warranted to expect this to also be
true of Spanish as a foreign language classrooms. Indeed, my interviews with several
instructors of beginning level Spanish classes confirm this: The learners frequently fail to
add the appropriate tense suffixes to the verbs and seem more concerned with the mes-
 sage than its accuracy. After having made his point above, Ellis (1997) goes on to survey
some of the most influential literature in the field of form-focused instruction. He con-
cludes that,
there is sufficient evidence to show that form-focused instruction can result in definite gains in accuracy. If the structure is simple in the sense that it does not involve complex processing operations and is clearly related to a specific function and if the form-focused instruction is extensive and well planned it is likely to work.

(Ellis 1997; p. 60)

This finding and the theoretical considerations discussed above inform my study in its selection of pedagogic angle and instructional approach, outlined below.

Considering Ellis’ (1997) findings that the input learners receive is impoverished and that more form-focused instruction might be beneficial, a survey of recent theories and methods that center on the issue of input brought up two interesting options: Structured input (VanPatten 1993) and enhanced input (Sharwood Smith 1991). Before turning to the discussion of enhanced input, which is the method my study will employ, a closer look at structured input is relevant in order to establish a more complete picture of the options and choices teachers face. The issue here is that input can be modified and structured in different ways depending on what one wishes to achieve in the learners; the kind of grammatical structure aimed at suggests which approach to employ.

**Structured Input**

Ellis (1998: p. 44) describes structured input as an option that asks learners to process input that has been specially contrived to induce comprehension of the target structure. Learners are required to listen to or read texts consisting of discrete sentences or continuous discourse and to indi-
cate their understanding of them, for example by carrying out a command, drawing a picture, ticking a box, or indicating agreement or disagreement.

This means that learners use the information inherent in the grammatical structure in focus to make a choice with regard to what is referred to outside of the sentence itself. In VanPatten and Oikkenon’s (1996) words, “processing instruction consists of explanation plus structured input activities designed to encourage learners to make better form-meaning connections during comprehension of sentences” (p. 498, author’s italics). An example of this can be found in VanPatten and Cadierno’s (1993) study in which they focused on the positioning of object-clitic pronouns in Spanish (e.g., *La sigue el señor*).

The word order in the italicized sentence is OVS as compared to *El señor la sigue* in which it is SOV. Both sentences mean “the man follows her.” The problem here is that learners of Spanish often mis-assign argument structure to sentences with reversed subject-object order. In their study 80 second-year university level learners of L2 Spanish were divided into three groups and compared. The groups received either no instruction, structured input, or production practice in the above feature. The subjects were tested by means of a discrete-item listening test and a discrete-item written production test. These tests showed that the structured-input group clearly performed better than the production-practice group on the listening comprehension test and that the two groups performed the same on a written production test. Follow-up tests conducted one month later confirmed these results. The conclusion that VanPatten and Cadierno draw is that the production-based instruction only contributed to explicit knowledge whereas the comprehension-based instruction resulted in intake leading to implicit knowledge. Several subsequent studies support these findings (e.g., Cadierno, 1995; VanPatten and Oikkenon, 1996), and
some (Salaberry, 1997; DeKeyser and Sokalski, 1996) show less conclusive evidence, causing Ellis (1998) to conclude that “structured-input practice may provide a useful alternative to production practice” (p. 47 – italics added).

With regard to explicit instruction of the target feature it is worth noting that structured input still relies on the explicit teaching and explanation of the target structure. It mainly differs from CLT in the way it explicitly focuses learner attention on the coupling between grammar and meaning and in its limited demands on the amount of output learners must produce. Even though this method has its strengths in the teaching of simple inflectional morphology it is unclear if it is able to address those aspects of grammar that carry no meaning, such as gender markers, or those which are functionally redundant, such as agreement, which is what my study deals with. Thus, while the method of structured input does belong within the realm of form-focused instruction that centers on the input level, it does not quite address the problematic issue.

**Enhanced Input**

In Sharwood Smith’s articles on Consciousness Raising (1980) and enhanced input (1991, 1993) he outlines his theory of how input might be constructed to facilitate learner noticing and intake. He points out that when learners communicate they often hear or read the whole stream of language input without processing it for more than its meaning. Thus, the linguistic forms used to convey the message may very well go unnoticed, especially by the learner whose interlanguage is advanced enough to cope with a majority of language situations. This, in turn, may lead to fossilization, as pointed out by
Ellis (1997) above. Likewise, it is obvious that beginning level learners in CLT classrooms with a focus on meaning often will be struggling just to understand the meaning of teacher or peer utterances and have virtually no processing capacities left to also attend to the linguistic form. If learners are to learn from the input they receive they must notice where the correct input differs from their own interlanguage (Sharwood Smith, 1993).

Sharwood Smith (1993) also makes a notable distinction between “competence versus control” (p. 169) which means that learners might have knowledge of a feature and know how it should be applied without being able to consistently do so in their own output. This, in turn, touches upon the “distinction…between various kinds of intuitive knowledge, inaccessible to conscious introspection, and metaknowledge, that is, knowledge that does involve conscious introspection” (Sharwood Smith, 1993: p. 169). He also states that what learners really do when they learn a foreign language is not as much to grab some ‘rule’ inherent in the target language but “rather internalize examples of the rule that they use to ‘crack the code’” (Sharwood Smith, 1993: p. 170). This means that teachers should help learners notice salient features of the target language in order to internalize a good set of representative examples.

In order to facilitate this internalization of representative examples and help learners focus on the linguistic form of the language input he suggests using enhanced input. Enhanced input “focuses on the operation that is carried out on the linguistic material” (Sharwood Smith, 1991: 120). This can be both visual enhancement (e.g. highlighting or color-coding) of specific morphological features or more explicit metalinguistic feedback. With regard to visual enhancement he distinguishes between positive and
negative input enhancement. An example of positive input enhancement could be, for example, that the third person -s in a text is colored green to signal the importance of the existence or occurrence of the form. Conversely, other material may be highlighted in such a way as to signal to learners what is not desired in their output. This last option constitutes negative input enhancement and involves giving the learners feedback about erroneous forms in their output or flagging incorrect forms in the teaching material. The fact that learners are given such clear feedback, possibly in metalinguistic terms, means that the theory of input enhancement implicitly seeks to affect the learners interlanguage continuum in all of the four ways outlined in Ellis (1998) computational model – see Figure 1 on p. 10.

The combination of enhanced input and grammar teaching by way of a focus on form brings up another related term which I shall briefly explain: *Enriched Input*. Ellis (1999) gives several examples of how instructional material may be modified in order for learners to better notice the targeted features. One is by way of “contriving input that contains numerous exemplars of a grammatical feature known to be problematic to learners” (p. 68). Other options within enriched input are the use of

oral/written texts that learners simply listen to or read, or written texts in which the target structure has been graphologically highlighted in some way (e.g., through the use of underlining or bold print), or oral/written texts with follow up activities that focus attention on the target structure.

(Ellis 1999; p. 68)
Ellis (1999) classifies enhanced input as a feature of enriched input and the experimental materials employed in my study most closely resemble those of the second option (graphologically highlighting the target structure). I shall subsequently review some of the research that has been done on enhanced input.

Jourdenais et al. (1995) set out to investigate if positive input enhancement of target forms promote second language learner’s noticing of these forms and if the input enhancement affected their production of the L2. The 14 participants were divided into two groups which were given different versions of a text that functioned as a stimulus for a writing task. The text differed in the aspect of enhancement of the target forms; One was unenhanced, the other had Spanish preterit verbs and imperfect verbs shadowed and bolded respectively. Both were also typed with different fonts from that of the rest of the text. Jourdenais et al. (1995) were able to determine that English-speaking learners of L2 Spanish, who had been given input enhanced stimulus texts, made more explicit references to preterit and imperfect verb forms when thinking aloud during the narrative writing task, as compared to those who did not receive input-enhanced instruction. They also found that the addition of input enhancement to a text that had already been flooded with target features made the participants who were presented with this text use more past tense forms. The results of this study therefore lend support to the theory of input enhancement and indicates that if learners can be induced to notice and focus on the target form(s) they are more likely to use them in their own production.

Another study which also supports the effectiveness of enhanced input was carried out by Leeman et al. (1995) who investigated two groups of L2 Spanish learners one
of which, the Communicative Group, experienced content-based instruction whereas the other, the Focus on Form Group, experienced enhanced input. The enhancement was done by highlighting preterit and imperfect verb forms in written input while telling the students to pay special attention to how temporal expressions are expressed in Spanish and correcting learner output errors. On the subsequent tests, which were a debate, an essay, and a modified cloze passage, the Focus on Form Group outperformed the Communicative Group by supplying the forms more frequently. The former also increased or maintained accuracy on all tasks whereas the Communicative Group improved slightly on the essay task but deteriorated on the other two. However, I agree with Ellis (1999: p. 69) when he points out that “the advantages found for the Focus on Form Group may not have been solely due to enriched input as the instruction this group received involved several options.”

Alanen (1995) also set out to investigate the role of input enhancement in second language acquisition. Alanen’s study taught L2 Finnish to 36 L1 English participants focusing on locative suffixes and consonant gradation. The participants were divided into four groups and were each given one of four possible treatments; a) plain text, no modifications, b) input enhanced text highlighting the target forms, c) grammar rule explanation and no text modification, d) both grammar explanation and input enhanced text. As part of the treatment the participants were given a short reading comprehension test and a 12-item word translation task. After the second and final teaching session the participants were also given a sentence completion test and a grammaticality judgment test. Alanen (1995) found no conclusive differences between groups when comparing a) with b) and
c) with d) though the results indicated that the enhanced input group (b) did use a variety of ungrammatical suffix forms, as compared to the control group’s (group a) zero forms. She suggests that the reasons for the high number of ungrammatical forms are that even though the input enhancement did make the participants focus on the target structures their attention “may not have lasted long enough or was too superficial for efficient retrieval to take place later” (p. 289). Finally, the results showed that the c) and d) groups, which both received explicit rule instruction outperformed both the control and enhanced input group. One reason for the inconclusive findings of this study might be that the quantity of the input enhanced material was limited to two short written texts. This fact is likely to have had a big effect on the results. Thus, future studies might benefit from supplying participants with greater amounts of input as well as a greater number of participants, especially since Alanen reports that the results of the control group were affected by a few participants with very good performances.

The above surveyed studies indicate that input enhancement does make learners notice the target feature and that learners need a certain amount of exposure in order for acquisition to take place. It is also clear that future studies would benefit from a more rigorous control of the instructional variables as well as more extensive data collection. Ellis (1999) adds to these findings his tentative conclusions that “there is fairly convincing evidence that enriched input (with or without highlighting) can help L2 learners acquire new grammatical features and use partially learned features more accurately” (p. 70). He furthermore states that
there is some evidence to suggest that when the exposure to enriched input is substantial, it works as, or more, effectively than explicit instruction in promoting acquisition of complex grammatical structures. However, explicit instruction may be more effective with simple structures.

(Ellis 1999; p. 70)

He bases these findings on a review of the above studies as well as others in the area. With the above findings in mind I would like to briefly sum up the findings so far and tie them in with my study. Afterwards, I will turn to my discussion of computer-based pedagogy.

We know from Ellis (1997, 1998, 1999) that form-focused instruction provides a viable alternative to production practice within CLT. More specifically, we have several studies in support of both structured input and enhanced input. However, structured input does not seem to be very well suited to teaching those aspects of grammar that carry no meaning, including agreement. Therefore, enhanced input might prove a better choice. Even though Ellis (1999) concludes that the evidence in favor of enhanced input suggests it is more effective for teaching complex grammatical structures, the above surveyed studies all testify to the fact that it is indeed possible to achieve positive results by using this method to teach more simple inflectional morphological forms. However, the results are not as conclusive as one could wish and further investigation might help produce better data.

Ellis (1999) groups enhanced input with enriched input. This fact, as well as the results of the abovementioned studies, suggests that the two methods together can be an
effective tool in promoting learner noticing of the targeted form. This, in turn, suggests that repeated exposure to and practice of a given form promotes acquisition. On the basis of this, one could argue that drilling and repetition might be useful activities. Drills were an integrated aspect of Audiolingualism (see Richards and Rogers (2000) for a detailed account) which was favored as instructional method during the seventies. It relied heavily upon memorization, drills, and the learning of the grammatical patterns, but I do not suggest that prolonged monotonous group chanting of paradigms would be beneficial in this case. Drills like these could be both boring and tedious, and carried very little intrinsic or extrinsic motivation for the students. I would, however, argue that a change in the way drills are designed and carried out might help learners acquire inflectional morphology; a more innovative approach integrating modern instructional technology seems promising.

Turning for a moment to Kumaravadivelu’s (1994) discussion of micro- and macro strategies and teachers’ choices of materials it is important to notice that in all of the above studies the instructional media were oral and paper-based whereas my study employs computer software. In itself this does not necessarily signal much of a change. However, according to Ellis (1998) the four options mentioned in Figure 1 constitute macro-options. These can be defined as more general focal points of the instruction “based on which teachers can generate their own situation-specific, need-based microstrategies or classroom techniques” (Kumaravadivelu, 1994, p. 32). Thus, individual classroom activities and instructional materials can be considered micro-options that are used to carry out the specific pedagogical aims of the lesson. The point here is that by merely changing the macro-strategy from a focus on production practice to a focus on
input, we may be able to better address the acquisition of inflectional morphology. A change of macro-strategy from an emphasis on production practice to an emphasis on input is entirely consistent with CLT. However, while CLT classrooms are often seen as the most learner- and communication-centered they still often only provide limited talking time to individual learners. Furthermore, even though learners are exposed to the targeted feature during communication, beginning learners, which would be the level focusing on learning this feature, will most likely pay more attention to the meaning rather than the linguistic form of utterances. In addition, it is my personal experience, as well as that of several of the teachers of L2 Spanish I have had contact with during this project, that when the teacher demands increased accuracy on tense formations learners resort to memorization of paradigms. In other words, learners drill themselves in the grammar. This indicates that even if the teacher attempts to teach the grammar of a language communicatively learners may still turn to methods characteristic of audiolingualism in order to actually remember the paradigms. In fact, the teacher who participated in my data collection indicated that she had on at least one occasion told students to memorize tense paradigms at home for the sake of improving their accuracy. It thus seems justified to look closely at the micro-options employed by teachers in communicative classrooms and try to determine whether some activities might be taught better with different methods and materials. This is where the aspect of drills and repetition comes in: By designing the instructional material, i.e. the software in my study, in such a way that the participants are encouraged not only to focus on the targeted morphological form but also to repeat the activities continuously, until they master the form, self-paced drilling is achieved while
providing the participants with a reason and a motivation for doing so. Moreover, the activity can be made much more enjoyable compared to the forced memorization that learners might resort to the day before an exam. I shall elaborate more on the motivational factors in the Method chapter.

**Computer-based Pedagogy**

The studies that employ computers and provide part of the theoretical background for my study can be divided into two different groups: Those that merely used computers as a method to carry out their experiment, such as those that investigate implicit learning (Mathews et al. 2000; Williams, 1999; Robinson, 1997; Gomez, 1997), and those that sought to investigate the usefulness of computers as a learning tool within various areas and/or discuss their applicability from a theoretical perspective (Rico-Garcia & Vinagre-Arias, 2000.; Herselman, 1999; Nutta, 1998; Levy, 1997; Quinn, 1997; Chun & Plass, 1996a, 1996b; Holland, Kaplan & Sams, 1995; Healey, 1992; Maddux et al. 1992; Alessi & Trollip, 1991). Each group will be discussed separately below, after which I shall summarize the theories that inform my study, before explaining it in detail in the Method section.

**Computers and Implicit Learning**

Delivering input to learners via computers is well known within the experimental world of linguistics and psycholinguistics. Computers have been used in several stud-
ies that investigate implicit learning (e.g. Mathews et al. 2000; Williams, 1999; Robinson, 1997; Gomez, 1997). The results of these studies support the potential benefit of implicit learning of rules and generative knowledge (Generative knowledge is defined as the ability to use a small subset of language data to learn a given rule which can subsequently be applied to novel instances of data). While most use artificial grammars which more or less closely resemble real language grammars, the processes they document and the results they report are interesting and highly relevant to my study.

One such study was conducted by Mathews et al. (2000) in which they sought to investigate “the processes that lead to acquisition of knowledge that can be applied fluently and used adaptively within a domain,” that is, generative knowledge. Corballis (1991 – quoted in Mathews et al. (2000; p. 161)) defined generativity as the ability to produce an unlimited number of representations from a small number of components and a set of rules for the combination of components – in essence what language users often do when learning and practicing a language.

Mathews et al.’s (2000) study comprised two parts, the first of which employed a poisoned food computer game which challenged participants to discover the rules of an artificial grammar. This grammar consisted of strings of letters, ten characters in length, which were stamped on food cans as they were moved from the cargo hold of a space ship to the mess, passing through various control devices, some of which were able to decontaminate the food in the can. Unless they had certain different sequences of stamps on their labels the cans had not been decontaminated and were poisonous to eat. In the first part of the study, which had 95 participants, there were 2 instructional modes, im-
plicit and explicit, each applied to half of the participants. Before they viewed a large set of sample grammar strings the explicit group was given instruction on what types of rules to seek and shown “how to build a transition map of a grammar from the use of paper and pencil to decipher the rules of the grammar” (Mathews et al., 2000: p. 166). The implicit group was only given sample strings to memorize. The participants had 4 practice sessions of 30 minutes each and the first three were followed by either a generate practice test or a string discrimination test, both of 30 minutes length, while the fourth was followed by a one hour version of one of these tests, which were administered so that an equal number of participants of both study modes (implicit or explicit) had both tests.

The test results clearly favored implicit learners with generative practice and led Mathews and his co-authors to conclude that the “knowledge acquired implicitly about the grammar by memorizing good strings was better able to support generating good strings than the explicit learning mode” (Mathews et al., 2000: p. 168). Since the final test involved timed generation of as many grammatical strings as possible it is worth noting that if implicit learners were simply producing memorized strings rather than actively generating them their hit rate would go down as the test progressed. It did decrease, but not at a significant level, from which we may conclude that both recall of previously practiced forms as well as active generation on the basis of rules take place when the language learner produces output. This relates to enhanced input because it indicates that the more language learners practice in the classroom on input optimized for retention the greater the chance is that they will recall it when they need to produce it and recognize it when they hear it in real-world interactions. The treatment given to participants in
Mathews et al.’s (2000) study also corresponds to enhanced input because students respond to, order, and rearrange their grammatical knowledge according to the input they are given without producing neither written nor oral language output themselves.

The second part of Mathews et al.’s (2000) study sought to emulate genuine language use more closely by giving the learners cues as to what grammar to use. Seventy-nine participants were given twenty minutes to learn the same grammar as above by way of the implicit method. Four sub-groupings of students differed with regards to the number of study strings they were given and if they could freely stack their cue cards or not. The test results showed that a small set of representative data with maximum learner impact on its organization proved the best but that even longer exposure to more instances of target data might prove beneficial in terms of developing automaticity and faster recall.

Mathews et al.’s (2000) study, and others like it, thus informs us that language input can be given to learners via computers. More specifically, we may conclude that flooding the learners with examples of accurate language data enables them to not only memorize these but also figure out the underlying pattern and generate new instances of correct grammar strings. However, it is important to point out that the implicit group in Mathews et al.’s (2000) study was neither encouraged nor instructed to figure out the rules of the target grammar. This differs from enhanced input in which learners are encouraged to pay attention to the instances of data in the input which demonstrate the already explained rule.

From Mathews et al.’s (2000) study we may also conclude that learners can learn by practicing with a reasonably limited set of sample data. The very nature of
teaching itself also supports this with its gradual progression and expansion of the learner’s vocabulary as well as progression from simple to more complex grammatical forms. This also indicates that a given inflectional morphological feature can be taught by using a representative sample of language which learners then practice on repeatedly – which in essence supports the use of repetition and drilling.

We are, however, cautioned by Schmidt (1994) not to just accept findings on implicit learning as absolute truths. He has provided a comprehensive discussion and evaluation of many of the major studies conducted within SLA and psychology in which implicit learning of languages was investigated. In his discussion he states that acceptability and grammaticality tasks are not very reliable ways of testing learners with regards to proving implicit language learning. Ellis (1991) supports this and points out that such judgments on the part of subjects can arise from either explicit knowledge, provided there is time, or implicit knowledge. His main conclusion is that implicit learning will not be effective if used as the only means of instruction in terms of learning a real language. The findings in support of purely implicit learning do not support this claim. Schmidt (1994) concludes that the discernable implications that can be drawn from experiments with implicit and explicit learning support a dual way of teaching where salient features are pointed out explicitly to students, so that they know for sure what to look for, after which they are presented with implicit input which gives them rich data from which they are able to start formulating the rule(s) for the targeted feature.

Schmidt (1994) also puts forward another important observation about the acquisition of skill; “the involvement of consciousness in performance diminishes with
increasing skill, and most skilled performance is intuitive, no matter how the underlying knowledge was established to begin with” (p. 180). This ties in neatly with the conclusions that Mathews et al. (2000) arrived at, which embodies the commonsensical notion that practice makes perfect and provides a good rationale for repetition and a certain amount of drilling within language teaching.

On the basis of Schmidt’s (1994) findings, as well as the conclusions reached in my discussion of enhanced input, we may conclude that it seems more effective to provide learners with an explicit explanation of the target rule, after which they are given input that is rich in examples of the target feature. Enhancing the target features in various ways has also been suggested and research has shown promising results.

A study which supports both explicit teaching as well as demonstrating an important aspect of implicit learning and memorization is Robinson’s (1997) study of 60 adult Japanese ESL learners which were split into groups and taught in one of four ways: Group 1) implicit condition; Group 2) incidental condition; Group 3) enhanced condition, and Group 4) instructed conditions. The enhanced condition was the one who received the focus on form by visually highlighting the target structure. The target was the acquisition of a rule regulating the argument structure frames of novel verbs of English. The subsequent tests showed that on a grammaticality judgment task explicit learners were best at recognizing new grammatical sentences, followed by enhanced learners. In terms of recognizing old grammatical sentences all groups had high scores. These findings inform my study in the way that they support the positive effect of repeated exposure to enhanced input (i.e. drilling) with the aim of developing automaticity in recognition and
use. Explicit learning is supported with regards to helping learners induce the general rules from the input presented to them and extend these rules to novel verbs.

Nagata (1998) is one scholar who recognizes the need for extensive exercises and drills within second language instruction, and Nutta (1998) points out that several scholars have advocated the use of computer-based tutorials and drills to free up more classroom time for real communication. Neither I nor the two authors above support a return to the rigid methods of Audiolingualism but rather that learners do need a certain amount of exposure to target forms in order to internalize them. It is in this connection that enhanced input becomes important and may play a role in facilitating the fastest and most qualitative retention of the target feature by learners. It makes sense to determine what works best for the different aspects of language that must be learned and try to incorporate the various instructional methods that prove best into the instructional syllabus. Ellis (1999) talks about this when he suggests combining different syllabi. He states that input-based grammar teaching should be seen as complementing communicative language teaching, not replacing it, a point which is also taken up by VanPatten (1996). Ellis (1999) states that input based instruction belongs to a structural syllabus which should be “used in parallel with a communicative syllabus” (p. 75), which should then employ the targeted features in communicative tasks. This is in concord with Ellis’ (1998) finding that in order “for the effects of instruction to be lasting, learners need subsequent and possibly continuous access to communication that utilizes the features that have been taught” (p. 66).
Before turning to a discussion of the use of computers within language instruction I would like to summarize the findings on computers and implicit learning. First of all, we may conclude, that the theory of generativity works well within language learning; indeed, it supports Sharwood Smith’s claim that language learners internalize representative samples of language and use these to deduct the rules from and apply to novel utterances (Sharwood Smith, 1993). These studies also show that learners do not necessarily need output practice in order to translate the input they have received into correct output. However, studies show that instruction works most effectively when learners are given explicit information about the target structure in the beginning, after which they are given the input material. This contrasts with the dominant way in which language is currently taught and practiced within CLT, namely through explicit instruction and communication practice. Lastly, several researchers suggest to use computer-based tutorials and drills to free up classroom time for real communication. This could be done by combining structural and communicative syllabi so as to keep the element of communication at the forefront and provide a rationale and framework for the drills and input exercises.

Computers and Language Instruction

Whereas there is little doubt that computers are effective for very specific learning tasks in well-organized experiments using artificial and semi-artificial languages with more easily interpretable outcomes, we should not forget to look at the factors that will affect the learning outcome in a real-world learning situation. More specifically, the
concern is with the learners’ interaction with the computers and the instructional software and the effect it has on them. Several scholars discuss the application of computers to the area of CLT (e.g. Chun & Plass, 1996a, 1996b; Healey, 1992; Herselman, 1999; Holland, Kaplan & Sams, 1995; Levy, 1997; Nutta, 1998; Rico-Garcia & Vinagre-Arias, 2000). One claim that one can safely make is that the possibilities with computers are very broad. However, there seems to be a general consensus among scholars that computers are best at delivering input and less apt at judging the correctness of language output, possibly due to the inherent creativity in language use. Thus, one might argue that computers are best at providing students with authentic and unmodified, high quality input (i.e. graphics, video and audio). I shall return to this point below. However, we first need to consider a valid point of critique before we move on: Might most topics and language aspects not be practiced just as easily and effectively with traditional materials, such as books, paper and pencils?

When answering this question I would initially have to concur that much instructional software is modeled on exercises and tasks that were previously carried out on paper. The software in my study in essence embodies fill-in-the-blank exercises with a limited pool of data to choose from. As such, the students might as well do this exercise on paper in the ordinary classroom. However, in order to get feedback, students would then have to hand in their exercises for the teacher to correct or the teacher would in other ways have to present the students with the correct answers and ask the students to self-correct. This could easily invite students to either not process the feedback from the teacher at all or to simply copy the right answers without processing the linguistic infor-
mation or updating their interlanguage at all. It would also require substantial time for the teacher to correct and write feedback or to check the final versions after the students’ self-corrections. On top of this an exercise of this kind would have to limit itself to a fairly small set of data, would require a substantial amount of time to complete, would most likely lack the auditory component with native-speaker input, and last but not least, carry very little motivation for the students.

In Nutta’s (1998) overview of some of the available studies on computer-based grammar instruction she concludes that it “can be as effective or more effective than more traditional instruction (e.g., workbooks and lectures)” (p. 51). A comparison of computer-based and paper-based material shows several advantages of the software employed in my study over the paper-based exercises. First of all, the amount of language data that can be worked with is much greater as the software can potentially choose at random from a very large database. Secondly, the learner is given immediate feedback when making an error or mistake, which Rico-Garcia & Vinagre-Arias (2000) point out is important in their comparison of print-oriented and computer-oriented tests. This, in turn, prompts the learner to modify his performance and update his interlanguage in order to be able to progress in the game. This feature is central because it motivates self-correction and learning. The motivation to do so comes from both intrinsic and extrinsic factors, a point which Rico-Garcia & Vinagre-Arias (2000) also stress and which I shall return to later. Having now established that computers and software materials have their own rights and merits in terms of the exercises and the input learners can be given, and that
they can present interesting, motivating and innovative opportunities, we turn to a closer look at computer games as language teaching material.

First of all, the nature of a game inspires the learner to reach a goal and rewards him or her immediately upon improvement, something that is rarely possible or practical to any greater extent in the regular language classroom. This introduces the aspect of entertainment, which is another factor of learner motivation. Much traditional language teaching software seems to merely adopt the design and features of traditional print-based material which is a poor way of utilizing the features computers can provide. In their spare time many language learners use computers for work and play and many see computers as multimedia centers that deliver entertainment and information with elaborate auditory and graphical effects. Thus, language learning software should aim for a design and a utilization of features that learners can recognize.

In her (1999) study Marlien E. Herselman investigated the effects of using computer games to teach English grammar with grade six ESL students in South Africa. The participants were divided into two groups depending on the socio-economic status of their parents; Resource Advantaged (RA) and Resource Deprived (RD). The games that were used were divided into two categories: Those that provided drills and practice and those that were strategy games. The former type was preferred by RD learners and the latter by RA learners. By administering pre- and posttests she determined that “there was a significant improvement in all learners’ language proficiency after the computer games were played” (p. 210). More specifically, relative improvement ranged between 9% and 3% with most improvement recorded for RD learners. Recognition was the overall moti-
vating factor, with 100% of participants agreeing that they experienced it. She states that “recognition was…the strongest intrinsic motivator for [all] learners,” (Herselman, 1999: p. 211) meaning that the students preferred games where they recognized the type of game and topic of the task that faced them. Challenge, curiosity and control were each also rated high. This indicates that “learners experience challenges in games when games are not too easy or too difficult,” that “curiosity is generated by activities that are novel, but not totally foreign to learners,” that “sensory curiosity is enhanced by different audio and visual effects,” and finally that contingency, being part of the control factor, “allows for a feeling of control when the outcome of the game is dependent on the responses of the learners” (Herselman, 1999; p. 206).

Herselman refers to several other researchers who are in favor of using computer games for ESL instruction (e.g., Maddux et al. 1992; Alessi & Trollip, 1991; Quinn, 1997). They each contribute their part to the picture of what should be included in good computer games for language teaching. For example, Alessi & Trollip (1991; p. 163) and Quinn, (1997; p. 3) argue that computer games offer motivational challenges which create competitive environments and affective experiences of fun in which learners can engage. Quinn (1997, p. 9) furthermore states that enjoyment and intrinsic motivation can be optimized by quick and clear feedback provided by the software. Csikszentmihalyi (1990, p. 9) in turn mentions several criteria for what makes a good game that will produce enjoyment. I agree with these, of which only three shall be mentioned here: a) Challenge is optimized, b) the activity has clear goals, and c) the activity provides clear and consistent feedback as to whether one is achieving the goals.
With regard to extrinsic motivation Ellis (1994) has a thorough discussion of this, based on several different studies. He concludes that students who have “an instrumental reason for learning an L2 can be successful” (Ellis, 1994; p. 514) and that if students are provided with monetary incentives to perform well, it usually works, but only as long as the incentive is there. With regard to intrinsic motivation it can also be a powerful tool. For example, a learner might attempt to reach a new high score of points, or a new level of the game with new challenges to be mastered. This will also help create a more goal-oriented learning experience.

In this discussion of the use of computers and computer games to teach language we should not forget to take a critical look at how computers are employed in today’s teaching environments and consider if this is really the optimal way of doing this. If we start by looking at the physical layout of most classrooms it quickly becomes clear that these classroom are optimized for the use of more traditional teaching materials, such as books and to varying degrees support the use of visual and auditory aids such as TV, video and sound systems. It is, however, exceedingly rare to see classrooms with integrated computers. They are often located in separate rooms which are often only open and available when a teacher takes the learners there to carry out specific tasks or exercises. While this is understandable from an administrative and financial standpoint, it is not necessarily the best in terms of language teaching.

J. Barson (1999) and J. Mugane (1997), together with other scholars, both counter this notion and use of computers. Instead they suggest to integrate computers in language classrooms to a much higher extent than they are in most language teaching
settings today. They also advocate a view of computers that ‘demystifies’ the use of technology and instead focuses on its abilities to foster “learner engagement, initiative, innovation, and creativity” (Mugane, 1997: p. 439). The point is, among others, that what often happens is that “technology becomes an end in itself [and] is used just for the sake of keeping up with the times” (Mugane, 1997: p. 438). Instead, computers and computer materials should be seen as tools with which certain exercises can be done, or information accessed, just as with any other language learning material. Ideally, computers would also be integrated in the classroom to an extent where laptops can be used by the students for just a short period in order to complete an exercise or look for a piece of information after which they can be put away again for the learners to turn to other materials and activities used in the lesson. While this scenario is still not realizable in most language teaching settings it is one that educators should strive towards and which counters the notion expressed by, among others, Nutta (1998), who views the use of computers and the purpose of communication as opposing factors. In my opinion, computer materials should be developed in a way that maximizes their ability to be integrated into a communicative syllabus. This is also to aim of the software developed for the purposes of this study; it is meant to be directly supporting the learners’ abilities to comprehend and speak Spanish.

Having now discussed the use of games in language teaching and how computers are currently used as well as how they could be used more effectively, it seems appropriate to analyze an authentic, commercial piece of language software for the learning of Spanish. By taking a critical look at which teaching methodologies are em-
ployed and which kinds of activities are used we will get a better picture of what is currently available and what direction commercial language learning software is taking.

I obtained a copy of Learn Spanish Now version 7.0! from the company Transparent Language, which states on the CD case that you get a piece of “Revolutionary Language Learning Software…that really works. Guaranteed!” Turning to the content of the CD it contains four main entries: a) Conversations in Spanish (with dialogs); b) A Spanish Adventure with Andrés (with dialogs); c) The Most Common Words in Spanish (with dialogs); d) Survival Phrases for Spanish (with dialogs). As is immediately apparent, dialogs play a big role in this software. In fact, everything is centered around the various dialogs which have very comprehensive, context-dependent features to aid the learner in learning and understanding the pronunciation, vocabulary, and grammar. This help to the learner relies very much on providing translations of words or sentences in the dialogs and on providing grammar explanations in English. However, these explanations are given using a fair amount of jargon which would probably confuse most beginning and intermediate learners who are not well-versed in linguistic jargon. For example, the word ‘decirme’ occurs in a dialog and the context-sensitive help indicates that the translation is ‘tell me’ and that the root of the word is ‘decir.’ However, the grammar explanation which shows up in a little window in the lower right corner is considerably more complicated: “Infinitive. Indirect object pronoun. Object pronouns and reflexive pronouns may be found attached to present participles and infinitives; they must be attached to affirmative commands.” This is not likely to be of much use to most learners. While the program has several other aspects I shall now move
to an analysis of those features that are most relevant for comparison with the software used in my study.

First of all, the program has several games included. These games, however, center around the manipulation of words and sentences, and apart from the crossword section, they all involve click and drag exercises at the word and sentence level, differing mainly in whether you get to start from scratch or have to unscramble and already scrambled sentence. While the game challenges you with speed and time restrictions on the different tasks and keeps track of your score, these exercises are essentially ones that are adopted from paper-based materials and have had sound and context-sensitive explanations added. Furthermore, the feedback you get when making an error is limited to “Sorry, that word is misplaced,” and no hints are given as to how to identify the correct word. For me, this meant that after I had tried three different words, which I considered the most likely ones to fit in that particular sentence, and had been told that they were all wrong, I simply resorted to trying them one by one in the list until I came upon the right one. I found that in this case my objective was not to learn which word was correct, but rather to get this word over with so that I could have a go at the next word.

In general, we must conclude that this kind of exercise provides very little intrinsic or extrinsic motivation, and that it does not force the learner to update his or her interlanguage. Furthermore, it quickly became apparent that the program works with a limited, albeit comprehensive, set of dialogs and that the trick to master these tasks seems to be to memorize the dialogs. Hereby, the manufacturers of the game have achieved the exact opposite of what seems to be their goal, when they state in the Successful
Immersion Approach Help Screen that, “By experiencing a foreign language in a natural context in LanguageNow! Titles, you'll learn much more thoroughly and pleasantly than by rote memorization and grammar drills.”

Secondly, this program handles grammar and morphology poorly. Whenever the learner right-clicks a verb it limits itself to providing lists of conjugated verbs together with rather long grammatical explanations and rules. This approach is excessively boring and could have been adopted directly from a grammar translation textbook.

On the basis of this I must conclude that even if this piece of software is a good example of how video and sound can be integrated with text to become an interactive learning material, it does not provide the learner with much incentive to progress in its various exercises, beyond the basic desire to learn the language. Furthermore, in the relevant areas of games and morphology the program fails to focus explicitly on the morphology of verbs and contains no exercises which prompt the learner to do so. Lastly, the fact that the program is based almost exclusively on the language of the built-in dialogs results in the same problem Ellis (1997) listed in relation to classroom communication; the learner focuses on the meaning, not the grammatical and morphological means of getting there, especially with regard to those that are less salient in terms of meaning.

When summarizing the use of computers in language teaching we may conclude that computers seem to be best at providing learners with language input and that the software exercises have several advantages over paper-based ones, particularly in relation to the amount of language that can be practiced and the timing of the feedback. In addi-
tion, practicing language with computers can help learners get a greater exposure to the language as well as capture their interest through several intrinsic and extrinsic motivational factors. It is, however, important that computer materials are produced and used correctly in order for them to be optimally efficient; merely adapting paper-based exercises to computers and adding some video and sound will not do the job.

**Summary**

Before turning to the method section and subsequently the results and discussion I would like to sum up the purpose and design of my study. Many variables interact in language teaching situations and since the experimental treatment in my study changes both the material used and the methodology employed the results can perhaps be confusing to interpret.

EFL / ESL teachers and researchers alike have come to realize that foreign language students have trouble with the inflectional morphology of many L2 grammars. Research on the topic has made it clear that the teaching methodology which is currently favored in most language teaching environments (CLT) has certain shortcomings in this respect. It is thus natural to look at already established, as well as emerging, methods and materials in order to see if this problem might be addressed with any of these. Considering that the use of computers in language teaching has made tremendous strides within the last decade and opened up new avenues in the teaching of foreign languages it makes sense to investigate whether already known methods and materials may be adapted to this new medium for an advantageous effect.
The theoretical foundation for using enhanced input is solid and research has shown that if used appropriately within a larger instructional framework it is likely to produce positive results. While this is partly supported by findings in the area of explicit and implicit teaching of grammar both Ellis (1991) and Schmidt (1994) caution against employing only implicit learning and instead support the use of both explicit rule explanation and subsequent practice on input filled with examples of the target feature.

Turning to the aspect of the use of computer software in my experiment it also draws support from these studies, most of which employed computers in the delivery of the input. However, very few of these studies sought to teach a real language. A major reason for this is that it is easier to control for intervening variables such as prior knowledge when the language is invented and thus new to everybody. However, several scholars have researched the applicability of computers to language teaching and their findings support the use of computers and outline several possible beneficial effects such as greater learner control over own learning, the possibility of more individualized teaching and the vital points of increased learner self-correction and motivation.

Considering these factors there is a strong indication that teaching the inflectional morphology of a real language grammar through input enhanced software materials will show positive results in the form of a gain in participant command and mastery of the target form. The following section describes the method of my study after which the results are presented, analyzed and discussed.
Method

Participants

Participants were 46 native speakers of Danish. Two participants’ data were excluded; one because this person arrived late and did not take the pre-test, the other because this person was an exchange student from Lithuania who had only been in Denmark for 6 months and who had obvious problems with both Danish and Spanish. Of the remaining 44 participants the age span ranged from 16 to 18 years of age (mean age = 16.79, std. dev. = .675 – one participant did not fill out this point on the questionnaire), and all participants were enrolled in one or the other of two L2 Spanish classes at Slagelse High School in Slagelse, Denmark. The spread in terms of gender were 27 (61%) females and 17 (39%) males. The participants were selected for this study on the basis of their enrollment in these beginner classes and their corresponding level of proficiency in Spanish. During the 6 months prior to the experiment the participants had received approximately 75 hours of instruction in Spanish, which was taught with an emphasis on development of communicative competence, writing, and basic grammar mastery. The approach used was CLT with elements of audiolingualism, such as memorization of verb conjugations. Disregarding the excluded participants, all participants had Danish as their L1, with the exception of one person who was bilingual Danish / Iranian. This person’s data was not excluded because she was fluent in Danish whereas the Lithuanian exchange student most likely had her acquisition of Spanish disturbed by her intense exposure to Danish. When all participants had Danish as their L1 and reported very limited, if any, exposure to Spanish prior to enrolling in this beginner class we may
safely assume that all participants had comparable proficiencies at the beginning of the experiment. Other foreign languages studied by the participants were English and German, but since these are Germanic languages their possible influence on the participants’ performance was regarded as minimal and they were not included as possible intervening variables.

In general, these participants, their background, and the setting are highly representative of the teaching of foreign languages in Denmark to people of this age group.

**Materials**

Two different instructional treatments were used in my study. The experimental group was taught with input enhanced software in the form of a game and the control group was taught with a collection of material which is representative of currently used CLT materials. The feature which was taught is the regular Spanish past tense (*pretérito*) which is expressed through inflectional morphological suffixes added to the stem of the verb. Spanish has three main classes of regular verbs which are classified according to the ending of the infinitive form; -ar, *hablar* ‘to speak’; -er, *comer* ‘to eat’; -ir, *dormir* ‘to sleep’ (See appendix A for the complete list of included verbs). A total of 18 different verbs were used, six from each class. The verbs were chosen from a beginner level Spanish textbook and prior to the experiment the classes’ regular teacher went over all verbs that might not be known by the participants and taught their meaning, but not their past tense declension.
By using a limited subset of Spanish verbs to practice the general rule of Spanish past tense declension my study follows the method of Mathews et al.'s (2000) study in which they found that this was an adequate approach. This also follows Sharwood Smith’s (1993) claim that learners learn a rule through exposure to a limited amount of language data.

Table 1: The Past Tense of the Three Regular Verb Classes in Spanish

<table>
<thead>
<tr>
<th></th>
<th>HABLAR</th>
<th>COMER</th>
<th>DORMIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yo</td>
<td>habló</td>
<td>Comí</td>
<td>dormí</td>
</tr>
<tr>
<td>Tu</td>
<td>hablaste</td>
<td>comiste</td>
<td>dormiste</td>
</tr>
<tr>
<td>Usted/El/Ella</td>
<td>habló</td>
<td>comió</td>
<td>durmio</td>
</tr>
<tr>
<td>Nosotros/-as</td>
<td>hablamos</td>
<td>comimos</td>
<td>dormimos</td>
</tr>
<tr>
<td>Vosotros/-as</td>
<td>hablasteis</td>
<td>comisteis</td>
<td>dormisteis</td>
</tr>
<tr>
<td>Ustedes/Ellos/Ellas</td>
<td>hablaron</td>
<td>comieron</td>
<td>durmieron</td>
</tr>
</tbody>
</table>

In Table 1 the three verbs introduced above are conjugated in the past tense. As can be seen, the verbs of the –ar class have different endings from those of the –er and –ir classes. This represents the standard declension of continental Spain. Central and South American Spanish is somewhat different and uses usted and ustedes with their associated verb endings instead of tu and vosotros/-as respectively. The –as endings on 1st and 2nd person plural pronouns represent feminine variants. The declension pattern of continental Spain was chosen because this is widely used in L2 Spanish teaching in Denmark. Teachers usually just point out the differences of Central and South American Spanish to students. Below, I will explain the two treatments of the study in more detail and explain how they are linked to the literature review.
The Experimental Group:

The instructional software used with the experimental group is in the format of a game. It was programmed by the researcher himself during a period of 5 weeks using the graphical programming application Authorware v. 3.5 by Macromedia. It currently runs on any IBM compatible PCs with the Windows 95 or higher version operating system. However, it can fairly easily be converted to also run on Macintosh computers. The game screen covers an area of 640 x 440 pixels. This has relevance for the screen resolution with which the computer monitor is set up; if the screen resolution is higher than 640x480 (Standard VGA) the game screen appears in the upper left corner. If the screen resolution exceeds 800x600 there is a chance the text and buttons will be too small for the player to comfortably read them. Below, I shall give a detailed account of how the program works.

In this game, different forms of past tense verb paradigms fall from top to bottom on the right side of the screen. The speed with which they fall is variable and depends on the difficulty level reached by the participant. As can be seen in Figure 2, the game screen contains active buttons on the left which the player clicks to pair the pronoun written on them with the appropriate verb forms. Along the top of the screen the current level the player has reached is displayed together the number of lives left and the accumulated number of points.
Figure 2: Game Screen

The player must then pair the verb form with the correct personal pronoun, which is done by clicking the pronoun. If the player does not match a pair correctly the slot next to the pronoun stays empty and the particular verb form is not reintroduced.

Figure 3: Incorrect Pairing of Verb and Pronoun
We see an example of this in Figure 3 in which the player is clicking the 2nd person plural pronoun ‘Vosotros/-as’ which does not match with the 3rd person plural ending on the verb ‘hablaron.’

When all six verb forms have been introduced the computer checks if all forms were placed correctly. In Figure 4 the player has not placed the 1st person singular and 3rd person plural verb forms correctly, and the computer has already deducted one life.

Figure 4: Evaluation of Player Performance

Subsequently, the same verb is introduced again (see Figure 5) for the player to be able to correct his mistakes. The game will not advance to the next verb or level until the player pairs all forms correctly.
In Figure 6 the game has advanced to the next verb after the player paired the forms correctly on his second attempt. All the slots have been cleared, the player given points, and a new verb introduced.
The game has 11 levels in which the number of verbs range from three in the first level to 10 in the eleventh level. Each paradigm is included three times in different levels to ensure even exposure.

Through level 3 the speed with which the verbs fall is constant at 5 seconds from top to bottom and there is only verbs from one class in each level. When level four is reached the verbs from the different classes are mixed. The speed is still 5 seconds, but increases in level 5 to 4.5 seconds for the verbs to fall from the top to the bottom of the screen. From level 6 on the pronoun buttons are mixed and no longer appear with the 1st person singular on top and the 3rd person plural at the bottom. This forces the player to link the individual verb forms with their associated pronouns rather than with the physical location of the buttons. Through the levels, the fall speed of the verbs decreases incrementally from 5 seconds in level 6 (the speed had been reset in order to compensate for the mixed pronouns) to 2.5 seconds in level 11. The 11th and final level has 10 different verbs of all three classes. However, when the last verb is reached the game does not end, but instead adds a value of 1 to the level counter, increases the speed with which the verbs fall by half a second, and starts from the beginning of the list of 10 verbs again. The player might not as such notice any difference from the other levels, except for the increased speed, but it means that not all verbs are practiced during the end part of the game. This difference, however, is unlikely to have any significant impact on the participants of the study.

Turning to another feature of the game, its audio dimension deserves mentioning. Spelling is coupled with sound by way of sound files. When the verbs start falling a
sound file is played containing a recording of its pronunciation. When a verb is paired with the correct pronoun, another sound file is played in which the pronoun and verb is pronounced together. When a player attempts to pair up a verb with a wrong pronoun no sound file is played. The sound files were recorded in high quality audio with a native speaker of Spanish.

Returning for a moment to the target structure and the theory behind my study the inflectional morphological characteristics of the Spanish past tense clearly place it in the group of grammatical features that Ellis (1997) points out as being problematic to acquire for L2 learners. In addition, it is also a fairly simple structure that does not require complex processing operations and which is clearly related to a specific function. These are all requirements that Ellis (1997) says must be fulfilled by the target structure in order for form-focused instruction to be effective. The studies by Jourdenais et al. (1995), Leeman et al. (1995), and Alanen (1995) all investigated simple grammatical structures like these and while their findings were a bit inconclusive due to various methodological problems they nonetheless led Ellis (1999) to conclude, on the basis of these and other studies, that complex grammatical features might be taught better with enhanced input than with explicit instruction. While the feature in question is not complex and the comparison of input enhanced material is not with explicit instruction but rather with CLT materials with a focus on communication practice the literature still gives ample support to this research design and its theoretical justification.

Even though Sharwood Smith and other researchers who have investigated the theory of enhanced input have not, to my knowledge, attempted to deliver input enhanced
material to research participants by way of computer software, I believe the experimental treatment in my study clearly incorporates enhanced input. The enhancement is achieved by requiring the participants to pay close attention to the morphological suffixes of the verbs in order to gain points. The participants must, in other words, make some choices based upon their knowledge of the morphological features of the target structure. When they make the right choices they are rewarded with points whereas they are prompted to try again when an error is made. By forcing the participants to rely on the inflectional morphological suffixes to determine which verb forms pair up with which pronouns positive input enhancement is used. By having the computer single out the incorrectly paired forms the learners are presented with negative feedback which Sharwood Smith (1993; p. 177) calls “negative input enhancement.” Hereby, learners are invited to self correct and update their interlanguage on the basis of the feedback. Their motivation to do so stems from their desire to advance in the game.

The reason for choosing computers as the micro-option for my study lies in several facts relating to the nature of computers, only two of which will be dealt with here: 1) Computers are tireless and patient, and 2) software can be designed to deliver instructional content to students in optimum ways while allowing the learner to select both when and for how long he or she wishes to receive input. This opens up several opportunities because computer software materials like these can be used both in class and out of class while allowing those learners with a greater need for practice than others to work alone on improving their language skills. Furthermore, skills like those dealt with in my study are often difficult to practice alone and the computer may here stand in for the teacher in
the tedious and time-consuming job of providing feedback to learners about their gram- 
mar mistakes.

On the issue of practice, I would like to emphasize the following: The Spanish 
past tense structure is a very simple concept to understand; basically you just have to add 
an inflectional suffix to the verb stem to form the correct conjugation. However, while 
this is easy to explain to learners it is apparently much more difficult to give them the 
needed practice in applying the rule in actual communication, whether written or oral. 
Ellis (1997) explained some of the reasons for this and while they are all important I con- 
sider it of crucial importance that the kinds of practice that are currently available to 
learners have serious limitations in terms of the amount of error correction and learner 
feedback that can be given by the teacher. Thus, the enhanced input software material 
employed in my study aims to make this focused practice possible in order for learners to 
better internalize the Spanish past tense formation rule.

Changing the perspective a bit it may be claimed that the computer software 
merely drills the learner. However, drills within language teaching are supported, directly 
and indirectly, by, among others, Robinson, (1997); Nagata, (1998); Nutta, (1998); 
Mathews, Roussel, Cochran, Cook & Dunaway, (2000) and are a good way to enrich the 
input supplied to the learner. By this I mean that learners are presented with much more 
substantial and focused language data than is possible within the same time frame with 
more traditional materials such as textbooks employing reading or grammar exercises. By 
providing a framework for the drills and a rationale for the repetitions learners are given 
the motivation to do them as well as a tool to measure their progress. As mentioned,
Herselman (1999) found that computer games within her drill and practice category caused the most progress in her participants’ learning.

On the topic of learner motivation the game used with the experimental group is likely to foster intrinsic motivation in learners due to several factors. Initially, it will be new to them and different from traditional classroom exercises and therefore interesting. However, what is more important is that the game is likely to foster in learners the desire to compete against themselves to reach higher level and score more points. Additionally, extrinsic motivation should be fostered through the aspect of competition between learners as to who can achieve most points and the highest levels.

The Control Group:

The instructional packet used with the control groups was put together by the researcher in cooperation with the classes’ regular teacher, who taught these groups. The packet contained typical grammar materials that were optimized for their communicative qualities in order to create engaging and challenging lessons. The activities that were carried out consisted of group work on conjugating verbs, fill in the blank exercises, paired information-gap activities and a grammar memory game. During the experiment the participants in the control group could freely ask for teacher assistance as well as use their regular course books which contained sample past tense verb conjugations.
Procedure:

Two different classes with 18 and 28 students, respectively, took part in the experiment, each on a different day. From these, data from 2 students were excluded from the data analysis, as described in the Participants section. The total time with each class was 100 minutes. The students had been introduced to the Spanish past tense three weeks before the experiment but had also since worked with other grammatical tenses. This is in line with Schmidt’s (1994) recommendation that salient features are first pointed out explicitly to learners, after which they are presented with enhanced input.

The data collection was carried out over two days during each class’ regularly scheduled class period. First, oral consent was elicited from the participants, after which the experiment was briefly explained as being a comparison of different teaching materials. The participants were then randomly assigned to one of two groups; experimental or control, each with 9-14 participants. A 3-stage written pretest consisting of a grammaticality judgment test, a timed cloze exercise, and a verb conjugation task was administered to both groups at the beginning of the experiment to assess their proficiency level. The test was designed this way by the researcher in order to get different measurements of the language abilities of the participants. This should help ensure more reliable comparisons. The design was complicated by the fact that the researcher does not speak Spanish and thus had to rely on other speakers of Spanish for translation of the test sentences, which were initially written in English. Writing and translating these while limiting oneself to using only the 18 verb database of the instructional software proved rather laborious and
time-consuming. In the end, all sentences were checked for errors by a native speaker of Spanish and by the classes’ teacher.

The test consisted of three parts. First, the grammaticality judgment test asked the students to identify which sentences had the verb in the wrong form and supply the correctly conjugated form, so as to prevent guessing. The students were given five minutes to examine twelve sentences. This test was useful because it is generally accepted as being one that taps into participants’ implicit knowledge (Ellis, 1991), which is an important feature of this study. In spite of the fact that Ellis (1991) in his investigation of the reliability of grammaticality judgment tests concluded that they are potentially unreliable we should be able to trust the results obtained in this study. The reason is that participants’ responses were only considered correct if they could supply the correctly conjugated form of the verb they had singled out as ungrammatical. Therefore, this test helps us determine how well the participants can use their knowledge of the Spanish past tense conjugation.

Secondly, the timed cloze exercise required the participants to correctly conjugate as many verbs as possible to create congruency with the subject of the sentence they belonged to, within the four minutes allotted to this task. This test was intended to measure the speed with which participants could conjugate verbs of all three classes and allow for comparisons of increases in accuracy within the number of verbs attempted, as well as general increases in the number of verbs conjugated by each participant.

The third and last test task, the verb conjugation task, asked the students to conjugate three verbs, one from each of the three main verb conjugation patterns. Three min-
utes were given for the completion of this exercise. This test would make it possible not only to get an estimate of the knowledge and performance of the participant, but also to identify if the experimental treatment biased participants towards this kind of completion of verb paradigms, rather than identification and use in contextualized sentences.

*The control group* stayed in the class’ regular classroom and practiced the target structure in a typical mixture of communicative grammar activities guided by the teacher. The instructional method used was CLT with an emphasis on meaning-focused communication and production practice of the target forms. It should be noticed that the activities conducted with the control group were somewhat different from what the teacher normally used. According to her and the class’ course book, activities were normally centered around reading, writing, fill in the blank exercises, and paired dialogs. Activities such as memory game and info-gap were rarely or never used. The activities and materials used with the control groups allow for a comparison of an instructional environment where the focus is on communication, production practice, and limited writing with that of the experimental group, which focuses on the input level and seeks to promote student mapping of patterns.

*The experimental group* was taken by the researcher to the computer room after the pretest. There, students were instructed to start the game and play continuously for 40 minutes. As for directions, students were just told to click the pronoun corresponding to the falling verb. The game had 11 levels and for each increase in level the verbs fell faster, giving the students less time to match them with the pronouns. Beginning with level 6 the pronouns were also mixed and no longer listed with first person singular at the
top and third person plural at the bottom. The speed of the game then decreased a little to allow the participants to become familiar with this new challenge, after which it increased again in subsequent levels. For the first half of class the students started from level one in the game every time they lost all three of their lives and had to restart the game. During the last half of class the students were instructed to start at level five by pressing a specific button on the startup screen, so that they got to the levels with randomized pronouns faster. This was done in order to force participants to associate the verb forms with the appropriate pronouns rather than the locative placement on the screen, as well as to make sure the got to the more challenging levels faster, so as to keep up their motivation.

A posttest of the same format as the pretest, but with rearranged and modified sentences and verbs to conjugate, was then administered to both groups at the end of the class period.

Analysis

The tests were scored twice by the researcher with an interval of two weeks. A few errors of calculation were found and corrected. During the correction of the tests some unforeseen problems were encountered:

When completing the automaticity part of the tests several participants did not proceed in a linear fashion but rather seemed to have identified solely the forms with which they felt familiar. This left several spaces blank in the 36 item form and made it difficult to determine exactly how many verbs had been attempted by each participant. More specifically, the problem was concentrated on those cases where the participant had
skipped a smaller or greater number of items in the test sheet and had not attempted to fill out the last item, which was number 36. If the last attempted item was 32, for example, it is difficult to know whether the participant tried the last four, but did not know them, or simply ran out of time and was unable to look at them. It was decided that the amount of items from the first item on the form to the last item the participant had attempted to answer would be considered the total amount of attempted items. In the cases where whole parts of the pretest had been left blank it was assumed that the participant had attempted all and was unable to solve any. However, since participants by no means always filled out the attempted items correctly, it was still possible to calculate and compare the increase in hit rate achieved by the two groups.

Another common pattern observed was that several participants left out or misplaced accents on vowels as well as misspelled the stems of verbs with stem changes. This meant that many participants had fairly low scores of absolutely correct verb forms. Instead, many went from relatively few attempts and correct forms to several attempted and several slightly incorrect forms which would have been correct if it was not for the accent and/or stem change errors. It was decided that since the experimental treatment emphasizes neither graphological accents nor changes in the spellings of verb stems, words which had only accent or stem errors should also be counted as correct. However, words with both kinds of errors in them were counted as wrong. The reason for this was that with both kinds of errors the conjugation was too far from its correct form to be acceptable or immediately recognizable. The reason for the accent errors is quite likely that because the participants’ L1 (Danish) does not use accents the participants did not con-
sider them an integral part of the spelling of the words and instead focused on getting the letters correct.

With regard to the verbs with stem changes there were only two (‘dormir’ and ‘leer’) which were included both because they are highly frequent but also because their endings are completely regular. Furthermore, they might also serve as indicators of how the participants responded to the instructional material. I shall return to this point in the discussion section.

One important mistake was committed during the design of the tests. Only verbs that were practiced during the experiment were included. This was initially done because it was seen as important not to confuse participants with verbs they did not know the meaning of. Had they been forced to stop to ponder the meaning of a verb this could have prevented a reliable count on the automaticity part of the test because they would be processing the verb forms for meaning at the same time as for grammatical accuracy. As it turned out, the failure to include other verbs presents a problem when attempting to interpret the results of the instructional treatment for the two groups. This point will be taken up in the Discussion section.

After calculating the results for each test task the data were entered into the statistical computer program SPSS and various analyses run to try to determine the effect of the experimental treatment according to the posed research questions.
Results

The results of the Independent Samples T-tests as well as other tests run are illustrated in Tables 2 – 8. The means expressed here are the mean improvements attained for each group from pre- to posttest.

Please note that for each of the values obtained the results are not significant, indicating a very similar effect for the two instructional modes.

Table 2. Results of Grammaticality Judgment Task.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT Group</td>
<td>23</td>
<td>1.3043</td>
<td>1.55021</td>
<td>.32324</td>
</tr>
<tr>
<td>Enhanced Input Group</td>
<td>21</td>
<td>1.7619</td>
<td>1.64027</td>
<td>.35794</td>
</tr>
</tbody>
</table>

In this table we see a higher mean score for the Enhanced Input Group which received enhanced input via computer software. It thus appears that there is a tendency for the Enhanced Input Group to perform better on this kind of exercise. However, the results were not statistically significant (p = .347, df = 42, t = -.951) because of the high standard deviations.

Table 3. Results of Automaticity Task.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT Group</td>
<td>23</td>
<td>11.7391</td>
<td>6.46119</td>
<td>1.34725</td>
</tr>
<tr>
<td>Enhanced Input Group</td>
<td>21</td>
<td>10.7619</td>
<td>5.31888</td>
<td>1.16067</td>
</tr>
</tbody>
</table>
In this table we see a higher mean score for the CLT Group. This suggests that the method and materials with which this group was taught work better than the enhanced input material. However, the absolute improvement is limited to a little less than one more correct verb form on average out of an average of about 12 correct forms. Furthermore, the results were not statistically significant (p = .589, df = 42, t = .545).

Table 4. Results of Verb Conjugation Task.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT Group</td>
<td>23</td>
<td>3.8696</td>
<td>4.50560</td>
<td>1.34725</td>
</tr>
<tr>
<td>Enhanced Input Group</td>
<td>21</td>
<td>2.9524</td>
<td>4.03083</td>
<td>1.16067</td>
</tr>
</tbody>
</table>

In this table we see a higher mean score for the CLT Group. This indicates a better effect of the CLT materials and methods, but the results were not statistically significant (p = .482, df = 42, t = .709).

Table 5. Multivariate Test for Instructional Treatment Bias.

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement over time</td>
<td>.890</td>
<td>18.247</td>
<td>2.000</td>
<td>41.000</td>
<td>.000</td>
</tr>
<tr>
<td>Improvement over time * INST_TYP</td>
<td>.049</td>
<td>1.010</td>
<td>2.000</td>
<td>41.000</td>
<td>.373</td>
</tr>
</tbody>
</table>

This table is a comparison of participant test results on all three tests in order to detect any possible bias of instructional treatment towards any one test. Improvement
over time is reflected in the repeated measures ANOVA using SPSS general linear model (GLM) repeated measures and shows us that there was a clear effect of the instructional treatment for both groups (p is significant at < 0.001). The combination of improvement over time and instructional type in the Repeated Measures GLM test indicates that neither of the two instructional treatments resulted in different amounts of improvement across the three tests.

Table 6: CLT Group Items Attempted on Automaticity Test

<table>
<thead>
<tr>
<th>CLT Group</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>27.52</td>
<td>23</td>
<td>9.486</td>
<td>1.978</td>
</tr>
<tr>
<td></td>
<td>27.57</td>
<td>23</td>
<td>8.506</td>
<td>1.774</td>
</tr>
</tbody>
</table>

In this table the number of items attempted on the automaticity test is compared between pre- and posttest for the CLT Group. These numbers are very close and as we can expect, the difference is not statistically significant (p = .711). There was virtually no increase in the number of items that the participants of the CLT Group were able to process on the automaticity test.

Table 7: Enhanced Input Group Items Attempted on Automaticity Test

<table>
<thead>
<tr>
<th>Enhanced Input Group</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>23.38</td>
<td>21</td>
<td>8.506</td>
<td>1.856</td>
</tr>
<tr>
<td>Posttest</td>
<td>26.95</td>
<td>21</td>
<td>6.407</td>
<td>1.398</td>
</tr>
</tbody>
</table>
In this table the number of items attempted on the automaticity test is compared between pre- and posttest for the Enhanced Input Group. While there does seem to be a difference this is not significant ($p = .282$). This indicates that on average there was no significant increase in the number of items that the participants of the Enhanced Input Group were able to process on the automaticity test.

Table 8: Automaticity Test – Comparison of Groups

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>23</td>
<td>27.52</td>
<td>9.486</td>
<td>1.978</td>
</tr>
<tr>
<td>Enhanced Input</td>
<td>21</td>
<td>23.38</td>
<td>8.506</td>
<td>1.856</td>
</tr>
<tr>
<td>Posttest</td>
<td>23</td>
<td>27.57</td>
<td>8.506</td>
<td>1.774</td>
</tr>
<tr>
<td>Enhanced Input</td>
<td>21</td>
<td>26.95</td>
<td>6.407</td>
<td>1.398</td>
</tr>
</tbody>
</table>

In this table the number of items attempted for both instructional groups are compared. While there does seem to be some difference between them on the pretest, this difference is not statistically significant ($p = .136$, $df = 42$, $t = .1519$). Likewise, the results for the posttest are even closer and are not statistically significant either ($p = .790$, $df = 42$, $t = .268$).
Table 9. Hit Rate Improvement on Automaticity Task

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT Group</td>
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<td>.20288</td>
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</tbody>
</table>

In this table the hit rate of the Automaticity Task is illustrated. This count was reached by dividing the number of correct answers on the pre- and posttest with the number of verbs attempted on each. While we do observe a significant increase in hit rates for the two groups (41.5% for the CLT Group, 31.7% for the Enhanced Input Group) the difference between them is, however, not statistically significant (p = .152, df = 42, t = 1.458).


Discussion

Due to the fact that the type of test employed and the type of response required from the participants is likely to have an effect on outcome measures the performance results for my study are investigated in relation to the types of tests employed. Test tasks such as grammaticality judgment and conjugation of a verb to fit a sentence are also ones that are very frequently used within the field to measure the effects of instructional outcomes in studies. This provides for better comparison of results with other studies.

Research Question 1: How does the use of computer software that employs enhanced input and an inductive approach to grammar teaching affect learners' retention and production of the targeted morphological forms as compared to paper-based, CLT-compatible grammar materials and exercises with an indirect focus on grammar through meaning-centered communication practice?

A. Grammaticality Judgment:

As can be seen in Table 2 the effect of instruction for the CLT Group was a mean improvement of 1.3043. For the Enhanced Input Group the mean improvement was 1.7619. These results are, however, not statistically significant and thus prompts the conclusion that both kinds of materials are equally effective.
B. Automaticity:

Table 3 informs us that the mean improvement for instruction in the CLT Group was 11.7391 and that of the Enhanced Input Group 10.7619. As this difference is not statistically significant we must again conclude that both kinds of instructional materials seem to be equally effective.

C. Verb Conjugation:

The results of the verb conjugation task are expressed in Table 4 and report a mean improvement of the CLT Group of 3.8696 and 2.9524 for the Enhanced Input Group. As with the two previous test results this is not statistically significant indicating a similar effect for the two kinds of materials.

While a finding that one set of instructional materials and accompanying micro-option was clearly better than another would have made it easier to make a clear-cut recommendation to teachers about what to use to teach the inflectional morphology of verbs, the above findings nonetheless present some interesting options. In fact, a result that clearly favored one set of materials over the other most likely would prompt more skepticism as to the validity of the tests and the study itself. As it is now, we may conclude that using computer software in the form of a game which incorporates enhanced input results in good retention and written production of the target forms by participants. Likewise, we may conclude that the CLT-compatible materials and exercises carried out with the control group support learning the inflectional morphology of the Spanish past tense equally well. Keeping in mind that a major aim of this study was to investigate if computer soft-
ware employing enhanced input might be a viable materials addition to CLT grammar teaching as it is predominantly carried out today, we may conclude on the basis of my study that this indeed is the case.

This finding supports one of Ellis’ (1999) findings while challenging another. Ellis’ (1999) finding that enhanced input “can help L2 learners acquire new grammatical features and use partially learned features more accurately” (p. 70) is supported. However, Ellis (1999) also posited that using just explicit instruction might have worked even better with this simple structure, rather than enhanced input. It is difficult to imagine giving learners more explicit instruction than they had already been given in the three weeks prior to the study. What I mean is that the workings of the inflectional morphology of the Spanish past tense are very simple to explain and it is difficult to see how repeated explicit explanation and/or practice of this structure, whether it be deductive and metalinguistic or inductive (for definitions see Norris & Ortega, 2000: p. 437), may further the kind of automaticity in recognition and production that learners need to acquire. In fact, it seems quite clear that what the participants of my study needed most was practice, not another explanation of the principle of the rule. This need for concentrated practice is quite likely not unique to the participants of my study but rather applies to most learners. Therefore, while the lack of statistical significance of the test results do not enable us to draw any conclusions as to which set of materials might be better, it is worth remembering that the effect of each of the materials was significant. Thus, it is clear that there is a positive effect of using the input enhanced software material even though its relative efficiency has yet to be proved.
With regard to the relative efficiency of the two instructional treatments there are also other factors which might affect the results obtained. As with Alanen’s (1995) study the experimental treatment was fairly short. It may very well not be realistic to expect significant differences in performance after only 45 minutes of instruction. This is not to say that the differences that were measured are not reliable but rather that more clear differences might not manifest themselves until the participants have received more substantial and prolonged practice in the target feature.

Another possibility is that the instructional treatments differ in their ability to achieve longer lasting effects in the participants. It is thus possible that a delayed post-test would show better retention of the targeted features in one group. However, just as was the case with the issue above, the allotment of time for data collection is an important and limiting factor in most research and this applied to my study too. Future studies should try to include a delayed post-test to cover this possibility. I shall discuss the issue of time limitations further in my conclusion.

Lastly, it may also be the case that the differences in the results of the two instructional groups were smaller than they would normally be because of the situation and the quality of the materials that were used. As previously described, the teacher admitted to not being as creative with the materials as the ones in the instructional packet used with the control group. This is likely to have had a positive effect on the participants’ level of attention and sense of enjoyment. The fact that they were part of an experiment, which was clearly new to the participants, most likely also had the effect of increasing their motivation. It is therefore possible that the experimental treatment with input en-
hanced software could have shown a higher relative efficiency if it had been compared with the grammar learning activities that the teacher normally uses with the learners.

Research Question 1.1: Are the positive effects of the input enhanced software material seen in all three tasks?

Considering that the experimental treatment involves drilling and repetition of verb paradigms one might justifiably expect that this would precondition participants for improved performance on some of the tests in my study while having an adverse effect on their performance on others. One could imagine that participants of the experimental group might be predisposed for the verb conjugation task while those of the control group might have an edge on the task that involved conjugating verbs in context to fit the subject(s) of sentences. However, based on the results of the Hotelling’s Trace test in Table 5 we are able to determine that this is not the case.

While this finding is encouraging, my study does not contain a range of test tasks representative of all possible real-world language use situations and neither did any of the reviewed studies. It is thus possible that students of either group may exhibit increased or decreased performance on other language use tasks. In particular, very few studies test participants on unstructured oral communication skills, possibly due to the difficulties of obtaining valid data on such tests. Further research should address this.

Research Question 2: What is the effect of the input enhanced software material in terms of improving participant memorization and recall of the targeted forms on a timed, con-
As we have already seen there was a significant effect for instruction in both experimental groups, indicating that the participants were able to learn the targeted form. However, even if both groups were able to learn by using their respective materials it would be interesting to determine if any of the two sets of materials promoted better memorization and faster recall of the target forms. The basis for this is that when learners have to use the language in real-world situations it is of great benefit to them to be able to quickly recall the grammatical forms needed to speak grammatically correct sentences. It improves their fluency and comprehensibility as well as strengthens their self-confidence.

Comparing the two instructional groups Table 6 informs us that there was no significant increase in the number of items attempted on the automaticity test by the CLT Group. This is also the case with the Enhanced Input Group, whose results are depicted in Table 7. This indicates that none of the instructional treatments caused an increase in the amount of target forms that could be processed within the same time frame. This result is supported by the findings in Table 8 which show us that no one set of instructional materials is superior to the other. While it is theoretically possible that this result could have come about as a result of a ceiling effect where the participants were not able to show their improvement because the test did not supply enough forms to process, the mean counts of attempted forms for the Enhanced Input Group and the CLT Group (26.95 and 27.57 respectively – out of 36 items) do not suggest that this is the case.
These findings are interesting considering the fact that the Enhanced Input Group performed no communication practice and did not practice on conjugating the target form in context, like the CLT Group. Furthermore, even though the difference is not statistically significant, the Enhanced Input Group did improve its mean number of attempted forms, as opposed to the CLT Group. These findings touch upon the differences between input and output practice, which will not be pursued in this paper. However, Nagata (1998) among others, discusses this.

Having now established that none of the experimental groups were able to significantly increase their processing of forms within the given time limit it makes sense to try to determine whether one group might then have increased substantially in accuracy as opposed to the other. The assumption was that whether or not participants were able to process more target forms they should improve on the percentage of correct forms within the amount attempted. Hopefully, there would also be an indication of which, if any, set of instructional materials created the greatest increase. Table 9 contains a calculation of the participants’ ‘hit-rates’ and we see that even though the participants assigned to the CLT Group improve their hit rate somewhat more than those of the Enhanced Input Group, the difference is not statistically significant. This, in turn, again leads to the conclusion that while input enhanced software materials are not superior to more ordinary CLT-compatible grammar materials they do constitute a valid addition to more traditionally used materials and exercises.

On the issue of the efficiency of the input enhanced software material some additional questions might also be raised. One of these concerns whether it would be possi-
ble for learners to merely master the game and not as such acquire the target feature. While it is difficult to give a definitive answer, just as it is in many other aspects of language acquisition research, I would generally disagree with this. It is, of course, theoretically possible, but the likelihood that this will happen is very limited. One important reason for this is that this software is not meant as the single, full solution to teaching learners the inflectional morphology of the Spanish past tense. Thus, complete mastery of the game is not a goal in itself and should as such not be rewarded by the teacher. Instead, the goal is for learners to practice with this software in limited, concentrated periods in order to be able to solve other communicative tasks related to the real world as well as the classroom. Considering that this software material is only meant as an addition to the several other effective materials and activities available to the teacher in a communicative syllabus there is no reason to expect that learners will single out this particular piece of material and attempt to master it for its own sake as opposed to try to use it to reach the general goal of the course.

On a related note I should mention that even if a learner was to try to memorize the physical locations of the buttons on the screen and match this with the verb forms, rather than the pronouns written on the buttons, this approach would not get the learner past the sixth level. At this point in the game, the order of the pronoun buttons is mixed and changes with each level up to the eleventh and final level.

Another question relating to the efficiency of this material as a language teaching tool concerns whether learners can get the correct answers by sheer random responses. While it is, of course, possible to merely click one of the six buttons repre-
senting the different options for pairing verb forms to pronouns and get it right out of luck, it is an approach that would not get the learner very far in the game. In addition, it would be frustrating and provide no challenge or motivation.

However, while there are no immediate and obvious reasons for why learners should not be able to learn the morphology of the Spanish past tense from using this input enhanced software material there is still the issue of whether the software leads to the acquisition of generalizable knowledge in the form of verb endings to attach to verb of the appropriate class, or simply results in root memorization of whole paradigms. The tests in my study were not designed to investigate this but future research should address this.

*Research Question 2.1: How may input enhanced software material most effectively be integrated in the CLT curriculum?*

There are several ways in which input enhanced software material can be integrated in the CLT curriculum. An important precursor for discussing this is, of course, that there would be a beneficial effect of doing this. Considering the results obtained in this study we must conclude that input enhanced software material is indeed able to teach the past tense inflectional morphology of Spanish. However, this said, it is important to emphasize that this discussion should not be seen as encompassing all the many available kinds of input enhanced material, but rather as centering on software identical to or very similar to that which I employed in my study, i.e. a computer game. Additionally, this
discussion presupposes that the educational institution has adequate computer equipment and that it allows students access to this outside of classes, in their spare time. Considering that the requirements of the software are relatively modest; any IBM PC compatible machine produced within the last 6 years should be able to run it, hardware demands would not disqualify all but the most resource-strong institutions, as could potentially be the case.

Returning to the discussion of how input enhanced material can be integrated in CLT it is, first of all, important that the teacher recognizes that input enhanced software material can be a useful addition to regular classroom activities and is willing to integrate this micro-option into the curriculum. Secondly, the teacher must realize that using just this one set of materials to teach various grammar forms is not adequate for full acquisition; Ellis (1997: p. 66) states that “for the effects of [form-focused] instruction to be lasting, learners need subsequent and possibly continuous access to communication that utilizes the features that have been taught.” This reiterates and reinforces one of the goals of my study, namely to investigate the qualities of enhanced input as a viable addition to CLT. This premise should be fairly easy to fulfill in most regular CLT settings. This takes us to the next question which addresses the issue of how often and how long learners should practice with the software.

While the amount of practice the learner gets is important, as well as is the amount of exposure to the target form, it is necessary to determine the optimum amount of time learners should use it. While my study does not include any test measures to try to determine this, I nonetheless noticed several things when monitoring the experimental
group. One striking experience with both of the experimental groups was that after about 25 minutes of the 40 minutes the activity lasted, a participant would ask me how long they were supposed to continue. This was usually also around the time when some of the participants had managed to reach the top level or a reasonably high score the first time. Until this time we must assume that intrinsic motivation helped capture their attention because, among other things, “curiosity is generated by activities that are novel” (Herselman, 1999; p. 206). At this point of the experiment the researcher then told the students to go on playing, that the experiment would finish in 15-20 minutes from then, and that they should concentrate on who could get the highest scores. This, obviously, was intended to spark some extrinsic motivation in the participants which is in accord with among other Quinn (1997) who states that computer games offer motivational challenges which create competitive environments.

On the basis of these experiences I would suggest that learners use a game like this for 10-20 minutes at the time when it is used as an in-class activity. An additional reason for this is that once the students have become familiar with the game the first time they play it, it will be known material, reducing the time initially needed to get familiar with the game. A further argument in support of this was the opinion of one of the male participants who commented that if he could just use this program for 10 minutes a day, for a week, he would be able to remember the endings of the past tense. This same person even asked for a copy to use at home.

Considering the above mentioned results it seems warranted to claim that input enhanced software like that employed in my study would be very well suited for use by
learners on their own, in their spare time either in school or at home. This would allow weaker students to practice more at a time that suits them while letting stronger students with fewer problems acquire the target form even faster while being engaged in a game. Traditionally, playing games, whether on computers or on paper boards is not used very frequently by most language teachers, and probably not associated with language learning by very many teachers or learners. Finally, we must also recognize that not all learners learn at the same pace and that most teachers have to introduce new topics and forms at a steady pace which may leave some learners wanting more practice of certain forms, which are difficult for them to understand or acquire. The software employed in my study could help alleviate problems like this by allowing all students access to intensive practice while being motivated to self-correct and thus update their interlanguage.

On the issue of learner differences it also seems relevant to touch upon the issue of learner preferences. While this was brought up above in relation to learner motivation it is also important to look at which types of learners might benefit from using this software. While it is not a point that I wish to belabor in great detail it is fairly clear that this software material opens up some interesting options for both introvert as well as extrovert learners. Extrovert learners, who often seek a dominating role in the classroom
Conclusion

On the basis of the criticism of CLT from influential scholars such as Celce-Murcia, Dörnyei & Thurrell (1997) and Ellis (1997, 1998), as well as others who call for a more direct, form-focused teaching of grammar within CLT, this study set out to investigate if enriched input (Ellis, 1999) and enhanced input (Sharwood Smith; 1991, 1993) would be a valid option and a viable addition to CLT grammar teaching. As most learners, even relatively advanced ones, have problems with morphological forms the Spanish past tense was chosen because of its inflectional morphological properties that are representative of and similar to those of many other languages. The participants chosen were high school students ranging from 16 to 18 years of age who had recently started learning Spanish. This age group and the amount and kind of language instruction they receive is representative of much of the language instruction taking place at institutions of higher learning around the world.

The theoretical issues and considerations were then coupled with modern instructional technology and integrated into a computer game. Hereby, a teacher-independent learning tool was created. This tool has the potential to be used for short periods during class time, as well as allowing learners access to instruction whenever it fits them best. In addition, they themselves can choose the amount of practice they want and the pace with which they want it. The software furthermore provides them with intrinsic and extrinsic motivation for using it by letting learners compete against themselves as well as against others.
The experiment that was carried out compared the input enhanced software material to CLT-compatible grammar teaching materials and the results of the tests confirm that learners may benefit from using this input enhanced software material to learn the inflectional morphology of the Spanish past tense. While it was not possible to determine if the input enhanced software material was more or less effective than traditional in-class, meaning-focused, communicative grammar activities it is clear that the effect for instruction is significant. Therefore, we are able to give a positive response to the central question of whether the input enhanced software material would be a valuable addition to the currently used meaning-focused grammar learning activities of CLT classrooms. However, more research is needed in order to better determine how useful it is.

Some of the factors futures research could benefit from modifying in relation to my study is the inclusion of verbs on the post-test(s) which are not included in the instructional material. Furthermore, a delayed post-test should be given and the instructional treatment should have a longer duration and could possibly be divided up into several smaller units. This would also make it possible to address the issue of whether the input enhanced software material leads to the acquisition of generative knowledge or instead promotes root memorization of full verb paradigms. In addition, it would be beneficial to try to determine the value of the auditory aspect of the input enhanced software. Listening tasks could be incorporated into pre- and posttests as well as could some form of speaking task. However, this last kind of test is notoriously difficult to administer and often results in data of limited reliability.
While on the topic of the usefulness of the input enhanced it should also be mentioned that the Spanish past tense form is representative of most of the grammatical verb tenses in the Romance languages and highly similar in form to Germanic languages such as German. This means that the principles behind this software allows it to be adapted to several different tenses as well as a great number of the worlds languages rendering this material a very adaptable language learning tool.

Speaking of language learning tools we must not forget that one method or material never does it alone. It is therefore imperative that the repetitious practice learners get with the input enhanced software material is combined with communicative activities in which learners are given the opportunity to use the forms they have practiced. In line with this it should be stressed that it is not the objective of this study to try to prove how language learning can be carried out with machines and how we will eventually be able to dispose of the concept of language teachers. On the contrary, it seeks to demonstrate, in part, how language teaching may benefit from using computers and software which has a solid basis in second language theory and methodology.

On the issue of methodology the use of drills and repetition proved very useful and indicates that this kind of language teaching activity might not be as bad as its reputation. My study has shown that several scholars support the use of drills to teach real as well as artificial language grammars. The fact that the drill is incorporated in a computer game in my study serves to amend many of its negative effects and provides the activity itself with the kind of purpose and motivation that the drills and pattern practice of Audiolingualism often lacked. This goes to prove that older methods and activities may indeed
prove useful and valuable when adapted to use with modern instructional technology. However, as good as this is the positive results achieved in my study are somewhat moderated by its limitations.

A limitation which impeded on my study might also hamper future studies: The unavailability of research participants. Five teachers or supervisors declined to participate in the data collection due to various reasons. This signals a great rigidity on the part of teachers and supervisors who seem to think that as long as everything is working fine there is no need to worry about changes or improvements. At Slagelse High School in Denmark, where the data collection was finally carried out, the participants were quite enthusiastic about being part of the study, even though it caused some concern and anxiety on the part of the teacher who participated. However, both the teacher and the participants agreed afterwards that it had been a very interesting experience and it was arranged with the teacher and the computer support person at the school that the program would remain on the computers used for the experiment for other students to use. In spite of the fortunate outcome in this case it is, unfortunately, quite likely that future studies will also encounter this problem of finding participants. A situation like this where few teachers and program supervisors are willing to open up regular language classes for research may result in a decrease in the amount and quality of data collected as well as further limit the already minimal communication between researchers and practitioners in the field of second language instruction.

Having now discussed both the positive and negative aspects of my study I would like to end this paper with a final remark on an important issue that my study
raises in relation to the use of computers in language teaching: While many professionals embrace the use of modern information technology a majority still do not know how to incorporate computers into their instruction or are skeptical of its possibilities. This goes for both older professionals as well as newly educated ones who exit programs in which there is no emphasis on computational skills, beyond simple word processing for writing papers. It is my experience and opinion that many instructors feel that when they finally attempt to use computers and some of the various commercial software products available they are forced to do it on technology’s premises. This, in turn, leads to uneasiness as well as prevents an effective integration of software material into the general curriculum. It is therefore evident that language teaching software must be made much more user friendly and adaptable while making sure it is based on solid theoretical foundations. Additionally, the institutions that educate the language teachers of tomorrow must incorporate the teaching of computer skills in the curriculum so that teachers exit with enough knowledge to feel comfortable using computers in the classroom on a regular basis. Only then will the true potential of computer use in language learning be unlocked.
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Appendix A: Definition of Terms

Automaticity:

Automatization is the process with which explicit and implicit knowledge of a given feature of a language becomes internalized in the learners so as to help them use it with less conscious attention and effort (Ellis 1997; pp. 124-25).

Consciousness raising:

Consciousness raising deals with “how certain features of language input to learners become salient” (Sharwood Smith 1991; p. 118). The term thus “denotes a deliberate focus on the formal properties of language with a view to facilitating the development of L2 knowledge. This focus can be initiated by the teacher, or it can be self-initiated, i.e., by the learner” (Ibid.). Consciousness raising is the term from which input enhancement was developed.

Direct approach:

Characteristic of a direct approach, in addition to communicative tasks, is a focus on form, a promotion of language awareness and consciousness-raising as well as explicit instruction. In addition, teacher formulaic speech plays a role by teaching learners chunks of words that they can use to perform various tasks without necessarily analyzing their structure.
Drills and pattern practice:

By drills and pattern practice is meant a language learning activity in which whole sentences, grammatical paradigms, or other lists of items such as prepositions are repeated continuously either alone or in groups for the sake of memorization.

Enhanced input / input enhancement: (Ellis 1999 + own)

Input to learners may be enhanced for them to notice it in various ways. The graphological highlighting of target forms in learner input forms the base definition of enhanced input for my study.

Enriched input:

In Ellis’ (1999) definition enriched input is carried out by “contriving input that contains numerous exemplars of a grammatical feature known to be problematic to learners.”

More specifically,

It can take the form of oral/written texts that learners simply listen to or read, or written texts in which the target structure has been graphologically highlighted in some way (e.g., through the use of underlining or bold print), or oral/written texts with follow up activities that focus attention on the target structure.

(Ellis, 1999: p. 68)

Explicit instruction:

Explicit instruction covers two forms: Direct and indirect explicit instruction. The former consists of explanations of the targeted grammatical form, the latter involves trying to
raise learners’ consciousness of the existence and workings of a specific form through analysis of data that illustrate the workings and rules governing its application (Ellis 1998).

Fluency:
The term fluency is described in Ellis (1994: pp. 393-395) in terms of temporal variables and hesitation phenomena. These terms include sub-features such as speech rate, pause length, length of run, repetitions and corrections. Thus, the term fluency refers to the ability of the non-native speaker to speak an L2 with a speech rate, pause length, etc. similar to that of a native speaker model, which serves as reference.

Focus on form / form-focused:
When speaking of form-focused instruction “SLA researchers refer to the attempt to focus learners’ attention on specific forms and the meanings they realize” (Ellis 1997; p. 41). The goal is acquisition with the view of reaching as good an accuracy as possible.

Generativity:
Corballis (1991 – quoted in Mathews et al. (2000)) defines generativity as the ability to produce an unlimited number of representations from a small number of components and a set of rules for the combination of components.
Implicit learning

Following Norris and Ortega (2000; p. 437) “when neither rule presentation nor directions to attend to particular forms [is] part of a treatment, that treatment [is] considered implicit.”

Indirect implicit approach to CLT:

Learners who are taught with an indirect approach “are not specifically taught the strategies, maxims, and organizational principles that govern communicative language use but are expected to work these out for themselves through extensive communicative task engagement” (Celce-Murcia, Dörnyei & Thurrell, 1997: p. 141). Classroom activities may include information-gap activities, role plays, and problem-solving tasks, (Schmidt, 1991 – quoted in Celce-Murcia, Dörnyei & Thurrell (1997: p. 141)).

Input:

Input constitutes the language data that learners are exposed to visually or auditorily, but does not include explicit information about the target language or structure provided by the teacher.

Interlanguage (system):

A learner’s interlanguage system comprises implicit knowledge of L2 items and rules (Ellis, 1997: p. 111).
Macro-options:

These can be defined as more general focal points of the instruction “based on which teachers can generate their own situation-specific, need-based microstrategies or classroom techniques” (Kumaravadivelu, 1994, p. 32). There are ten different options which Kumaravadivelu (1994: pp. 32-42) deals with, two of which are to “facilitate negotiated interaction” and “contextualize linguistic input.”

Metalanguage:

Metalanguage constitutes the language that teachers use to talk about language such as the vocabulary involved when referring to sentence constituents.

Micro-options:

Individual classroom activities and instructional materials can be considered micro-options that are used to carry out the specific pedagogical aims of the lesson. For example, in order to facilitate negotiated interaction teachers can use group activities as well as try to ask “referential questions which permit open-ended responses, rather than display questions which have predetermined answers” (Kumaravadivelu, 1994, p. 34).

Negative feedback:

In Ellis (1998: p. 52) words “negative feedback shows learners that an utterance they have just produced is incorrect.” The purpose is for learners to notice the difference between their own productions and grammatically correct productions. In addition, the
teacher may also “provide examples of unacceptable forms, saying that they are unacceptable” (Sharwood Smith, 1991: p. 123)

Negative input enhancement:
Negative input enhancement constitutes feedback to the learners about errors in their output. This may be done either by graphically flagging errors in written output or by way of auditory or visual indications of errors in spoken output (Sharwood Smith 1993).

Production practice / output practice:
The principle behind production practice or output practice is that learners are pushed from controlled to automatic use of the target structure. The activities can range from “highly controlled text-manipulation exercises (e.g., a substitution drill) to much freer text-creation tasks” (Ellis 1998; p. 50)

Structured input:
Structured input is specially contrived “to induce comprehension of the target structure” (Ellis 1998: p. 44). Learners should only indicate their understanding of the meaning of the target structure “by carrying out a command, drawing a picture, ticking a box or indicating agreement or disagreement” (Ibid.). In doing so they are forced to process and interpret the function of the targeted linguistic feature. None or very limited oral output is expected.
### Appendix B: Spanish Verbs Included in Software

#### -IR

<table>
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<tr>
<th>Verb</th>
<th>Yo</th>
<th>Tu</th>
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#### -ER

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#### -AR

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<th>Tu</th>
<th>El/Ella</th>
<th>Nosotros</th>
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