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Enhancing a process-oriented approach to literacy and language learning: The role of corpus consultation literacy

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Abstract

Corpora and concordancing have become much more widely available as researchers recognise that they can significantly enrich the language learning environment. There is still, however, a strong resistance towards corpus use by teachers and learners (Römer, 2006:122). An understanding of the implications and relevance of corpus use for pedagogy may help teachers and learners overcome this resistance, and hence accelerate the process of "percolation" (McEnery & Wilson, 1997:5) or the "trickle down" (Leech, 1997:2) of corpus research to language teaching and learning. The pedagogical context in which learners' consultation of corpora (corpus consultation literacy) can be developed is fundamental in understanding this new literacy and developing it so that it leads to successful language teaching and learning. This paper seeks to investigate the role which corpus consultation literacy plays in enhancing the language learning process and, consequently, aims to establish whether this new literacy can contribute to a process-oriented approach to language learning. Firstly, a theoretical overview of a process-oriented approach to language learning will be outlined, before investigating if corpus consultation can potentially enhance such an approach. This will be supported by evidence from a number of published empirical studies, covering aspects such as learning within a constructivist framework, and the development of cognitive and metacognitive skills through the use of cognitive and developmental tools. Learners' comments from related studies, namely Chambers and O'Sullivan (2004), O'Sullivan (2006), and O'Sullivan and Chambers (2006), which pertain to the learning process and the influence of corpus consultation literacy on this same process, will also be considered. The hypothesis presented here is that corpus consultation literacy can enhance a process-oriented approach to language teaching and learning. It is envisaged that this research will contribute towards the establishment of a sound theoretical and pedagogical foundation for the integration of corpus consultation literacy into language teaching and learning.

Keywords: Process-oriented approach, new literacies, corpus consultation literacy.

1 Introduction

To enhance and contribute to the main goals of language teaching and learning, the integration of developments in information and communications technologies (ICT) into the language learning process should be driven by the findings of theoretical and

pedagogical research in second language acquisition (Levy, 1997), not led by the technological innovations themselves (Little, 1998; Chambers, 2001). Without the support of a sound theoretical and pedagogical foundation, practices involving ICT may be unsuccessful in enhancing language learning and teaching. This is particularly true in the case of the use of corpora in language teaching and learning. Therefore, the theoretical and pedagogical context in which corpus consultation can be developed as a new literacy is fundamental in understanding this new literacy and developing it so that it leads to successful language teaching and learning. In this study, the role of corpus consultation literacy in language teaching and learning will be situated in the context of one particular area of second language acquisition research, namely process-oriented instruction.

Product and process are both critical aspects of language education (Markee, 1997). However, in the past, language educators tended to focus on the product (Breen, 1984; Candlin, 1984), namely "the knowledge and skills which learners should gain as a result of instruction" (Nunan, 1988:27). There was little regard for the learning experiences themselves. In recent years, there has been a shift in focus from the end products of instruction in favour of a move towards incorporating a greater emphasis on process in the language classroom (Nunan, 1988). While the importance of product is not being cast aside (Breen, 1984), the value of a focus on process is increasingly being recognised, and a combination of both product and process is being encouraged (Spada, 1987; Nunan, 1988; Warschauer, 2002). Within the changing technological environment facing teachers and learners today, the notion of process has particular significance. Processes involving autonomous learning and collaborative learning prepare learners to keep up with these changes and continue their own learning outside the classroom (Warschauer, 2002).

For a very long time, literacy was seen as a product, the resulting outcome of instruction. However, literacy can no longer be thought of as a uniform set of abilities that can be transferred to students and that students themselves can transfer from one language to another (Warschauer, 1999; Kern, 2000). Neither can it be viewed in isolation from the broader social, cultural, economic, and technological factors surrounding it. This is reflected in definitions of literacy which have moved from concentrating on the cognitive dimension of reading and writing to focusing on the cultural and social dimensions of literacy.

> […] literacy skills and literacy acquisition do not constitute a single unitary cognitive process across cultures and social groups; rather, there are different sorts of literacy skills which develop to serve the needs of each social/cultural group […] The central issue in literacy development is not the development of uniform cognitive skills, but the recognition that there are many different literacy practices, of which only a few are likely to be valued by a given educational system. (Grabe & Kaplan, 1996:14)

There is thus a need to reconsider literacy less in terms of the product of being literate and more in terms of the process involved in becoming literate. For Kern (2000:39-40), becoming literate in a foreign language is not so much "a matter of achieving a particular critical level of reading or writing performance, as it is a matter of engaging in

the ever-developing process of using reading and writing as tools for thinking and learning in order to expand one's understanding of oneself and the world". Consequently, literacy should no longer be thought of as reaching a certain level of competence, but rather engaging in the process as a tool to develop further. Arguably, attention in language learning should be given to the process involved in becoming literate, rather than just focusing on how well a student needs to be able to read and write in order to be considered literate. In this context, a process-oriented approach appears to be most appropriate, emphasising the need to reconsider literacy in terms of the processes involved in becoming multiliterate.

In this paper, it is argued that corpus consultation literacy may have an important role to play in enhancing such a process-oriented approach to language teaching and learning.[1] Firstly, an overview of a process-oriented approach to language learning will be outlined, before investigating if corpus consultation can potentially enhance such an approach. This will involve defining process-oriented instruction and outlining its key features. Each of these features will be explored individually to investigate the extent to which corpus consultation literacy can enhance such an approach. Evidence will be drawn from a number of published empirical studies which investigate the benefits of language learners engaging in corpus-based activities (Stevens, 1991; Aston, 1996; Qiao & Sussex, 1996; Cobb, 1997; Dodd, 1997; Johns, 1997; Thurstun & Candlin, 1998; Bernardini, 2000, 2001, 2002; Kennedy & Miceli, 2001; Cheng *et al*., 2003; Sun, 2003; Chambers & O'Sullivan, 2004; Yoon & Hirvela, 2004; Chambers, 2005; O'Sullivan & Chambers, 2006). Additional data arising from action research carried out at the University of Limerick, which investigates empirically the effects of corpus consultation on students' writing skills in French (O'Sullivan, 2006), will also be included.

2 Process-oriented instruction

2.1 Moving from product to process

As has been previously outlined, within traditional types of instruction, a strong emphasis was placed on the product and the performance of the learners, namely the things that they could do as a result of instruction (Nunan, 1988:11). The product was therefore seen as a means of defining standards and had learning outcomes as its

1. It could equally be argued that corpus consultation literacy may have an important contribution to make to post-process theory and pedagogy, which Atkinson (2003:10) describes as "investigat[ing] the complex activity of L2 writing in its full range of sociocognitive situatedness, dynamism, diversity, and implications". For instance, researchers such as Aston (2001) and Mishan (2004) discuss how corpora can be used in collaborative and communicative tasks, thus extending beyond the cognitive aspects of learning and enhancing its social dimensions. However, since post-process pedagogy privileges the social aspect of learning rather than the cognitive process (Atkinson, 2003; Matsuda, 2003), this study will examine corpus consultation literacy in the context of process pedagogy, as the hypothesis presented here claims that corpus consultation has a particularly important contribution to make to learners' cognitive development.

primary concern. Syllabi were specified in terms of the end product or the outcomes of instruction (*ibid*.). Such methods of instruction have come under serious attack because students failed to apply what they had learned to contexts outside the classroom to solve real problems. Current theories of teaching and learning, namely cognitive and social constructivist theories, highlight how learning is a process of knowledge construction and not a matter of absorbing and reproducing knowledge (de Jong & van Hout-Wolters, 1994). The work of Vygotsky (1978), in particular on the Zone of Proximal Development, has shown that people learn best when they are actively involved in constructing their own knowledge. They have a store of knowledge which acts as a base for future learning, thus when engaging in knowledge construction, they activate this "pre-knowledge" to enhance the process and continually add to their store of knowledge (Biemans, 1994:28). Therefore, the teacher cannot simply hand over knowledge to the learner; the latter has to participate actively and engage in the learning process: "In our view the learner should be considered as an active constructor of knowledge: in essence, the learner is no Xerox copier that purely reproduces external knowledge (nor should he/she be encouraged to behave like that)" (Biemans, 1994:27). Within this discussion of the changing view of knowledge and learning, what is particularly clear is the reoccurrence of the word "process". Alongside this awareness of process in learning emerged process-oriented instruction. The key features of this approach will now be examined, before investigating if corpus consultation literacy can enhance such an approach.

2.2 Defining process-oriented instruction

De Jong and van Hout-Wolters (1994:8) define process-oriented instruction as "instruction that fosters learning and thinking skills and metacognitive knowledge that is needed in the construction of understanding and use of knowledge". Vermunt (1994:15) defines it in a similar fashion, highlighting the importance of developing learning and thinking strategies in coherence with domain-specific knowledge. Bolhuis and Voeten (2001:838) use the term process-oriented teaching as an umbrella term to refer to practices which help learners to develop their learning processes, and their definition focuses on teaching that facilitates independent learning. Fulfilling the educational goals of promoting learner autonomy and self-directed learning can be an enormous challenge for teachers and learners, as learners are not all naturally predisposed to taking control of their own learning. They need to be guided in learning how to learn and how to handle their autonomy, something which Bolhuis and Voeten (2001) report is often neglected. Therefore, process-oriented instruction aims to fill the gap in the lack of attention which is paid to learning how to learn in order to improve the quality of learning processes and engage learners in active knowledge construction. It deals not just with content, but more specifically with how this content is acquired. It involves explicit teaching on how to learn while attending to the learning process. This will then allow learners to keep up with the cognitive demands placed on them in a rapidly changing society, rather than merely reproduce what they have already learned by heart (de Jong, 1995). Engaging in a reflection on the fundamental assumptions of knowledge on which process-oriented instruction is based, namely increasing the mental activity of the learner, will presently allow the key features of this type of instruction to be identified.

2.3 Key features of process-oriented instruction

Volet (1995:451) outlines where the focus of process-oriented instruction lies, namely on the mental activity of the learner, and on increasing this activity during learning. In process-oriented instruction the mental activity of the learner comprises several distinct features which coincide with the four main principles of process-oriented teaching, as outlined by Bolhuis and Voeten (2001:838-839) and Bolhuis (2003:338):

1. move gradually to student regulation of the complete learning process;
2. focus on knowledge building in the domain (subject area);
3. pay attention to emotional aspects of learning;
4. treat learning process and results as social phenomena.

This involves, firstly, a gradual transfer of responsibility and control of the mental activity from the teacher to the learner. Moving gradually from teacher to student regulation requires the teacher to show how content is acquired by modelling learning and showing learners how to proceed with the learning process, gradually stimulating them to participate. Bolhuis and Voeten (2001:839) suggest that this is best done by getting them to discuss their approach to learning and to deal explicitly with the learning process involved in acquiring knowledge. De Jong (1995) suggests that process-relevant feedback, modelling, scaffolding, reciprocal teaching, and cognitive apprenticeships all have an important place in process-oriented teaching. Secondly, focusing on knowledge building in the domain requires that the mental activity is contextualised: "it involves inducing students to learn simultaneously the content of a given domain and the strategies for learning and using that particular content effectively" (Volet, 1995:451).

The third principle, paying attention to emotional aspects of learning, recognises the difficulties and demands that face students, and thus strives to make learning a worthwhile experience. This can be achieved through positive feedback which is task-oriented. Bolhuis (2003) recommends that teachers discuss emotions with students and guide them in dealing with these emotions, particularly when learning is difficult. The fourth and final principle of process-oriented teaching is to treat the learning process and results as social phenomena. Volet (1995:451) highlights the importance of the social aspect of mental activity, hence the value of collaboration and "a socially supportive learning environment". Process-oriented teaching aims to teach skills for social learning so that students can learn from those around them, both in the classroom, which is a social learning environment in its own right, and beyond the classroom. This is based on the work of Vygotsky (1978) on cognitive development and social interaction, namely the development of thinking strategies through interaction with others (Volet, McGill & Harriett, 1995). To summarise, this type of instruction assigns a central place to the learner, involves a gradual transfer of control from the teacher to the learner, and emphasises the importance of learning and thinking skills and strategies, and activities which promote awareness of these. From this, it can be concluded that process-oriented instruction is not a simple form of instruction. The key features of process-oriented instruction will now be considered. However, not every feature will be discussed; only those features which the researcher believes to be relevant to the context of corpus consultation literacy will be examined.

Process-oriented instruction involves the instruction of cognitive and metacognitive strategies. One very important element of this is making learners aware of the processes in which they engage when learning, what de Jong and van Hout-Wolters (1994:4) term metacognition. This involves teaching learners how to "become aware of 'what you are cognitively doing' and how they can monitor and regulate their cognitive comprehension activities". They need to be aware of how they themselves learn best and identify their preferred learning styles and strategies. Therefore, they need to reflect upon how they learn, identify their strong and weak points as learners, and continually build up their knowledge of the learning process in order to use that knowledge strategically. De Jong (1995:320) highlights the importance of this concept of learning regulation competence and self-regulation in order for them to become competent learners. He also highlights how reflection is essential in the process of building up metacognitive knowledge, in particular reflection on the cognitive, affective, and regulation strategies and activities in which learners engage in the process of knowledge construction. Reflecting on these issues will help learners acquire the skills and strategies which will help them regulate their cognitive processes and activities, and thus develop self-regulation. The following is a summary of the key features of process-oriented instruction discussed in this and previous sections. Process-oriented instruction

- facilitates the construction of knowledge;
- increases the mental activity of the learner;
- fosters learning and thinking skills;
- develops learners' cognitive strategies;
- fosters metacognitive knowledge, making students aware of how they themselves learn best;
- facilitates independent learning;
- teaches students how to regulate their learning gradually.

The aim herein is to discuss how corpus consultation literacy can contribute to a process-oriented approach to language learning. However, beforehand, it is important to consider issues pertaining specifically to the place of process-oriented instruction in language teaching and learning.

3 Promoting process-oriented language teaching and learning

Candlin (1984:31) is critical of traditional syllabi which are primarily concerned with what is to be learned, namely content or subject-matter and, consequently, the "achievement of ends". He claims that they act as commands for what it to happen in the classroom and are based on a "pre-packaging of knowledge" (32). In the context of language teaching and learning, this means that there needs to be a move away from traditional language learning syllabi which concentrate on language as the primary subject matter. Breen (1984:52) suggests the following: "An alternative orientation would be towards the subject matter of *learning* a language. This alternative provides a change of focus from content of learning towards the process of learning in the classroom situation". He compares the language learning syllabus to a process of map-making, whereby in product-oriented instruction, the destination is the beginning of the

map design and predetermines the route which the map will follow. Conversely, for Breen (1984:52), in process-oriented teaching, propriety is given to the route itself and the process of learning, that is propriety of process over content, thus involving a shift of priority from ends towards means. Candlin (1984:33) suggests a syllabus that is "concerned as much with the learning experiences it offered to learners as with the subject-matter content of those experiences". He does, however, suggest that a focus on both content and procedure is needed. Such thoughts are echoed by Spada (1987), who highlights the need to include both a process and a product component in classroom research. It is a serious problem that these two are seen as competing with each other rather than complementing each other: "both a product component and a process component are essential if we are to arrive at a better understanding of the relationship between teaching and learning in the second-language classroom" (Spada, 1987:153). Nevertheless, there is often a concern among teachers that if they have to spend time teaching both the content and the process, it will take a lot more time and slow down the delivery of content. However, Volet (1995:453) argues that the results are worthwhile and that the increased mental activity has a positive impact on the quality of learning which far outweighs the slower pace of study. Vermunt (1995:327) reiterates this point stating that any outlay in terms of time is quickly rewarded in "qualitatively better learning processes". He also states that the quality of university education can be considerably improved, thus preparing students to continue to learn independently when they leave university.

Although these suggestions by Breen and Candlin were made as far back as the mid 1980s, more recent research has shown how process-oriented instruction remains estranged from the classroom. The results of a study carried out by Bolhuis and Voeten (2001:846) revealed the following: "Only 5% of the total amount of time was spent on process-oriented teaching, explaining, asking questions, and giving feedback concerning the learning process". Therefore, it is necessary to investigate ways of promoting process-oriented teaching and learning. As we shall see, corpus consultation is one means whereby a process-oriented approach to language learning can be enhanced.

4 Corpus consultation literacy

Traditional definitions of literacy have tended to focus on reading and writing, what is termed traditional print literacy or "letteracy" (Papert, 1993:11). Such definitions relate to one's ability to understand and make meaning from printed texts (Pettersson, 2000:1). However, the definition of literacy has changed considerably since the proliferation of new media. In addition to providing new ways of teaching the traditional literacies of reading and writing, developments in ICT have themselves become a new type of literacy which has to be acquired if a person is to be considered literate in this technological environment:

> Our information age has expanded considerably the concept of 'literacy'. While technology offers new ways to teach the traditional literacies of reading and writing, learning how to use digital technology has become itself a vital stepping-stone to being 'literate' in the twenty-first century. (Godwin-Jones, 2000:11)

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Technology therefore becomes both a component of, and a means of, achieving literacy: "Literacies are themselves technologies, and they give us the keys to using broader technologies" (Lemke, 1998:283). As technology advances, new forms of literacies unfold, regularly redefining what it means to be literate. The emergent literacies are often referred to as new literacies. Semali (2001: Introduction, para.2) defines new literacies as "those literacies that have emerged in the post-typographic era". He uses the term post-typographic "to mark an intellectual and cultural shift in the way information is designed, communicated, and retrieved" (*ibid*.). In recent years, researchers have identified a number of literacies which are particularly useful in the area of language teaching and learning, namely multimedia literacy, digital literacy, and web consultation (Warschauer, 1999; Cope & Kalantzis, 2000; Kasper, 2000; Murray, 2000; Richards, 2000). One new literacy which is proving to be of particular value for enhancing language teaching and learning is corpus consultation. Interestingly, however, at no point in the literature relating to these new literacies is there a mention of corpus consultation, and yet it is clear to those researching in the area of learner access to corpora that corpus consultation may form a particularly important new literacy. O'Sullivan (2006) brings together these two research areas, namely new literacies and corpus linguistics, and expands the definition of new literacies to include corpus consultation literacy. The next section will engage in a close examination of the potential of corpus consultation literacy to enhance the pedagogical context of a process-oriented approach to language teaching and learning.

5 Enhancing a process-oriented approach:the case for corpus consultation literacy

As we have seen, process-oriented instruction is rooted in cognitive and social constructivist theories of knowledge development, which highlight how learning is a process of knowledge construction and not a matter of transferring and absorbing knowledge. One of the reasons for the increasing popularity of giving learners direct access to corpora is the paradigm shift from concentration on the activity of teaching to a focus on the learning process (Cobb, 1997). Corpus consultation fits in with the theoretical assumptions underlying process-oriented teaching and is particularly suited to pursuing constructivist principles of language learning, as it provides learners with the tools and resources needed to construct their own knowledge (Kettemann, 1996). When learners acquire knowledge through corpus consultation, they are actively involved in the process. The teacher does not pass on the information to the learners, expecting them to passively fill up their minds with this knowledge. They have to decipher this information for themselves and, therefore, become actively involved in the process. They take on the role of researcher, as outlined by Johns (1991), or explorer, as outlined by Bernardini (2001, 2004), engaging in a process of discovery and exploration through data-driven learning, which allows them to challenge not only the linguistic authority of the teacher (Owen, 1996; Aston, 1997), but also the dictionary and the traditional grammar book. As we shall see, corpus consultation can enhance each of the key features of process-oriented instruction. Evidence from several published empirical studies previously outlined, along with action research carried out by the author at the University of Limerick, will be considered in order to establish the practical scope for corpus consultation literacy in developing a process-oriented approach to language teaching and learning.

5.1 Increasing the mental activity of the learner

By having to work things out for themselves, learners increase their mental activity throughout the process. They not only learn about the language, but also, in the process, their ability to figure things out is developed, as they are required "to puzzle out how the language works" (Johns, 1997:100-101). Breen (1984:54) highlights the importance of the process of "working-out – and working through – content or subject matter", which corpora and concordancing allow learners to do. Corpora provide the hints, but the learners have to work hard at trying to understand them. Firstly, corpora stimulate curiosity by encouraging the learner to formulate questions (Bernardini, 2002). As outlined by O'Keeffe and Farr (2003:402), corpus consultation "develops a sense of enquiry". It also develops the learner's sense of speculation. When engaging in corpus consultation, learners go through distinct stages. Firstly, they have to formulate a question for which they seek answers, then in order to find the answers they must devise a search strategy. Once the concordancer has produced some evidence, they must work through this evidence before drawing any conclusions and formulating hypotheses. The learners have to engage in activities which are mentally demanding and require a process of reflection and reasoning. Corpus consultation involves the following types of mental or cognitive skills: predicting, observing, noticing, thinking, reasoning, analysing, interpreting, reflecting, exploring, making inferences (inductively or deductively), focusing, guessing, comparing, differentiating, theorising, hypothesising, and verifying. These activities not only increase the mental activity of the learner, but also they help learners to develop their learning and cognitive processes. As Kettemann (1996:4) outlines, cognition includes "attention, perception, memory, reasoning, judgement, imagining, thinking and speech". Sun (2003) investigated qualitatively the learning processes and strategies employed by EFL learners in a web-based concordance setting, when engaging in an activity to correct their grammatical errors. Through methods such as think-aloud protocol, she was able to capture learners' comments on their thoughts and behaviour during the activity. The study allowed her to get a more in-depth understanding of the learning processes and strategies employed by them, which she subsequently divided into four stages: comparing, grouping, differentiating, and inferring (Sun, 2003:405). The level of mental activity of the learners in this study was noticeably increased when they engaged in corpus consultation.

5.2 Developing learners' cognitive abilities

The cognitive skills outlined in the previous section, for instance, hypothesising, reasoning, guessing, and focusing, are all strategies which foster and lead to improved thinking and learning skills and strategies, and therefore build students' cognitive abilities. Wolff (1997:23) states that concordancing is a very powerful cognitive tool: "The concordance program as a cognitive tool provides categories to classify the complexity of linguistic data; it stimulates the learner's cognition and thus improves the knowledge-construction processes". The type of learning involved in corpus consultation, in particular inductive learning and discovery, stimulates deep processing (Aston, 2001), which may lead to more effective learning: "The depth of linguistic

processing required by the tasks is likely to have a positive effect on the learner's explicit learning" (Bernardini, 2000:234). Corpus consultation has the potential to develop students' analytical skills (Dodd, 1997; Fox, 1998) and develop their abilities to notice features of the language, developing a sense to recognise schemata which are central to language learning. Bernardini (2001) reports that students become very good at noticing things such as semantic preference and semantic prosody. According to Willis (1998), concordancing raises an awareness of language. Similarly, Bernardini (2001:209) reports that her students felt it was a kind of "consciousness-raising activity". In addition, corpus consultation has the power to focus the learner's attention. It increases observation, attention, and capacity for reflection. It also develops learners' problem-solving abilities (Johns, 1991; Qiao & Sussex, 1996; Johns, 1997; Kennedy & Miceli, 2001), which can be used to resolve many other language problems (Stevens, 1995:2). All of these thinking and learning skills and strategies develop learners' cognitive abilities, thus enhancing process-oriented instruction.

5.3 Fostering metacognitive knowledge

Engaging in these types of activities not only develops learners' cognitive abilities, but also enhances their metacognitive abilities. Concordancing has the power to make learners aware of the learning process in which they engage. Qiao and Sussex (1996) outline how learners, through the use of corpora and concordancing, develop and explore strategies for learning the language. The tasks involved in corpus consultation encourage the learner to observe and reflect on the processes in which they engage, constantly reflecting on these strategies, and revising and refining them until they find a way to work out how to find what they are looking for in the corpus. Learners can be further encouraged to develop their metacognitive awareness by asking them to reflect on the type of processes they engage in when undertaking corpus consultation. For example, in Kennedy and Miceli (2001) and Cheng *et al*. (2003), the students were asked to reflect on the processes in which they engage by showing the researcher how they went about their work and discussing the strategies they employed. Similarly, in recent studies carried out at the University of Limerick, namely Chambers and O'Sullivan (2004), O'Sullivan (2006), and O'Sullivan and Chambers (2006), when engaging in corpus consultation literacy to correct errors in their written French, the students were asked not only to identify the problem and try to resolve it, but also to reflect on the process by explaining the search words they used and discussing what they had learned. Sometimes, when conducting a search, the students realised that the search string was producing no interesting results so they had to rethink the process and come up with a new search word. Fine-tuning the search strategy requires students to think a lot about formulating the question and devising the search strategy so that they are appropriate and effective. When faced with difficulties, students learn to adopt alternative strategies (Bernardini, 2000). Reflecting on these has the power to make students aware of the processes in which they engage when learning and become aware of what they are cognitively doing. Cheng *et al*. (2003:180) undertook mini-projects with their students and asked them to reflect on their learning experience. Students revealed very positive views about the process of corpus-driven research, highlighting that they not only learned linguistic features, but that this type of project stimulated

inductive learning strategies and allowed them to focus on the process of learning. Aston (1996) reports how the students in his study learned not just from examining the solutions, but also from the processes involved in designing the searches. Very often in corpus consultation, the processes in which the learners engage in order to identify specific features of the language are as important as the results of the analysis, thus enhancing both their cognitive and metacognitive abilities.

This is clearly demonstrated upon analysing learners' reaction to engaging in corpus consultation in recent action research carried out at the University of Limerick (O'Sullivan, 2006). This research investigates empirically the effects of corpus consultation on students' writing, in particular how corpora and concordancing can be used by native English speakers at both second-year undergraduate level and postgraduate level to correct their errors and improve their writing skills in French. The students consult a small corpus of texts written by native speakers on a similar subject to that studied in their French module and use the concordance data to self-correct their errors inductively. They then provide written feedback on the changes which they have made, including comments on the corpus consultation process and on their evaluation of the activity. Drawing on evidence from participation evaluation and questionnaires allows the effects which corpus consultation literacy has on advanced learners' writing skills to be mapped out and their reactions to this process to be determined. It is important to note some of the limitations and restrictions of this study. Firstly, as in many other action research projects, the number of participants is limited. This is not surprising given the constraints within which action researchers must operate, particularly in terms of the number of learners, and the time and resources available for training students in corpus consultation. Similarly, limited time and resources prevented the present researcher from investigating areas other than learners' writing skills. Despite such limitation, such an action research project can make a significant contribution not only at the local classroom level, but also as part of the broader agenda to enhance the use of corpus consultation in language education. Although the focus of this research was on the use of corpora in the revision and correction stages of the writing process, this is not to say that they do not have an important place in the other stages of this same process, for example, in the pre-writing stages or as a resource for learners to consult while they write. For a detailed account of the results of this research see O'Sullivan and Cambers (2006).

The students' reaction to the process of engaging in corpus consultation as a means of improving their writing skills was generally positive. Having observed the corrections made by the students and analysed the processes which they had to go through to arrive at these corrections, it becomes clear that knowledge is not simply transferred to the learner, but rather the focus is on the construction of knowledge and the learning process. It is evident that the learners are actively involved in the learning process, constantly having to figure out what is wrong with what they have written. The learner becomes the researcher and engages in a process of discovery, continuously formulating questions, puzzling things out, guessing, comparing, differentiating, formulating hypotheses, and drawing conclusions, thus developing their analytical skills, their capacity for reflection, and their ability to solve problems. This activity stimulates the learner's cognitive processes, and the mental activity of the learner is visibly increased. For instance, students often had to carry out several searches in order to figure out what was wrong with an original error and correct it. In the initial analysis of the errors and

how students went about correcting these, many examples of the processes in which they engaged can be observed. For example, in order to get from the error *pas sans succès* to *non sans succès* (not without success), the student had to carry out three concordance searches, fine-tuning the search in each instance to try to figure out what was wrong, and wade through the concordances in order to find the solution. This student had written in the commentary *pas sans success* and it had been underlined as being unacceptable. It is obvious that the student is not sure where the problem lies, but some very clever use of the concordancer leads him to uncover the correct phrase. Firstly, he carried out a search of *pas sans* and discovered only one example in which *pas sans* was followed by a definite article. This led the student to question if this may be where the problem lay. Was he missing a definite article? Then he carried out a search of *sans* and discovered that *sans* is normally followed directly by a noun, thus discarding his assumption of a missing definite article: "*Sans* followed by a noun (directly) may indicate that the assumption of a missing definite article may not yield the correct version". After a third search, he uncovered *non sans*, thus rendering the correct phrase *non sans succès*.

Asking the students to discuss what they had discovered each time they carried out a concordance search further enhanced the mental activity of the learners. Of particular note are the comments relating to the actual learning processes involved. For example, one student was convinced that the expression *au même temps* (at the same time) was correct. A concordance of *même temps* revealed 12 occurrences of *en même temps*. In this instance, the student states that she must "unlearn *au même temps*", and she later comments in the evaluation form that consulting the corpus is "good for 'unlearning' errors, i.e. making me search to find out what is wrong with something that I have convinced myself (somehow!) is correct". Furthermore, other comments made by the students support the claim that engaging in this type of activity not only develops learners' cognitive abilities, but also enhances their metacognitive abilities and awareness, thus making students aware of what they are cognitively doing and, consequently, enhancing a process oriented approach to language learning. For example, students made the following comments:

- "Sometimes I think it has a much greater learning effect if we can learn about a language using for example corpora instead of just getting taught".
- "Good for 'unlearning' errors - i.e. making me search to find out what is wrong with something that I have convinced myself (somehow!) is correct".
- "Note: this is good as making me search might engrain it in my brain".
- "It has opened my eyes".

Based on these and similar remarks made by the students, it can be concluded that corpus consultation literacy can present an opportunity for learners to notice their errors and provide evidence that learners can use to correct their linguistic output, while enhancing both their cognitive and metacognitive abilities.

Furthermore, examining the students' engagement and interaction with the corpus in the empirical study shows how the corpus data can be authenticated (Mishan, 2004), namely the corpus engages the learners' interest and provides many opportunities for them to recreate authenticity in the corpus and respond authentically to genuine texts. The students' interaction with the corpus stimulated the learners' effort to engage and

communicate with the text, and embark on a process of reformulation in order to express their ideas. The students were not imitating what they uncovered in the corpus, but rather discovered patterns that could be adapted to their own essay. This counterbalances one of the criticisms of corpora made by Cook (1998) who questions the use of the native-speaker behaviour presented in corpora as a model for imitation by learners. However, proponents of the use of corpora in language learning do not advocate this kind of behaviour and use of corpora: "There is, however, no reason to assume that the materials we present to learners should constitute models for imitation and it would be wrong to expect corpus data to do so either" (Gavioli & Aston, 2001: 240). This is exactly where the value of corpora lies: "It is precisely because they do not simply offer models to imitate, however, that corpus data seem valuable to learners […] For learners, the reality of corpus data would seem principally to lie in the extent to which they can interpret them to create models of their own" (*ibid*.). Corpora allow learners to be creative and engage in a process of authentication, interpreting the data rather than simply engaging in processes of imitation of authentic data. In some cases, the results of the initial searches carried out by learners make them curious to explore further, encouraging and motivating them to read more of the text from which the concordance lines came, or to embark on new searches in a serendipitous manner. This demonstrates how the students' engagement and interaction with the corpus makes it possible to authenticate the corpus data by means of an authentic language learning activity.

5.4 Facilitating independent learning

Bernardini (2001) claims that the skills and strategies which can be developed through corpus consultation are the types of skills which will allow learners break free from tuition and become autonomous, independent language learners, thus coinciding with some of the other defining principles of process-oriented teaching. Firstly, corpus consultation allows learners take greater control over their learning which proceeds within a constructivist framework. Learners can make choices about what they want to learn and engage in learning that they have chosen: "language research is learner-initiated in the concordancer-based learning environment" (Sun, 2003:611). They can choose what they would like to explore and how they are going to go about it, a process which, according to Bernardini (2001:244), is more meaningful and likely to increase motivation amongst learners, factors conductive to greater autonomy: "Insofar as learners are free to select areas to explore and techniques for doing so, they are more likely to see their work as meaningful and relevant to their immediate concerns". They become active participants in the learning process, setting their own tasks, answering their own questions, and formulating hypotheses for themselves. Chambers (2005) reports how the students in her study comment on the self-directed nature of the learning process involved in this form of discovery learning. Equally, corpus consultation literacy develops in learners the ability to "learn how to learn" (Johns, 1991:1) and to develop independent learning strategies (Bernardini, 2000). For example, the type of corpus-aided discovery which Bernardini (2002) promotes places control of the learning process in the hands of the learner. Aston (1996) highlights how corpus consultation fosters critical autonomy. Also of utmost importance in relation to learner autonomy is the fact that the processes and strategies which learners develop when

engaging in corpus consultation can be transferred to other areas of language learning (Mparutsa, Love & Morrison, 1991; Thurstun & Candlin, 1998) and that learners can do this confidently (Kennedy & Miceli, 2001; Yoon & Hirvela, 2004). It can therefore be concluded that corpus consultation literacy has the potential to equip learners with some of the necessary skills to become successful autonomous language learners.

Their claim to learner autonomy is not just in theory; it is also the case in practice, which is reflected in the amount of comments relating to the potential of corpus consultation to enhance learner autonomy and independent language learning made by students in recent studies at the University of Limerick (O'Sullivan, 2006). Comments such as the following were made:

- "A fairly reliable resource for independent learning"
- "Autonomously discover your errors"
- "Sometimes I think it has a much greater learning effect if we can learn about a language using for example corpora instead of just getting taught".
- "Effect of finding out things on your own"
- "It is a step-up from studying grammar books as you can see or discover new patterns and words for yourself".
- "There are no disadvantages, it acts as a tool, one can't become over-dependent on it. It can't do homework for students, just provide support for students of languages".

These comments go a long way towards supporting claims that corpus consultation can indeed enhance learner autonomy and independent language learning, and consequently, contribute to a process-oriented approach to language teaching and learning.

6 Conclusion

It is clear from the above comments made not only by the researchers, but also by the learners themselves, that corpus consultation literacy has an important contribution to make in enhancing a process-oriented approach to language teaching and learning. Engaging in corpus consultation can provide an environment which promotes knowledge construction and fits well with the theory surrounding process-oriented instruction, as it presents students with the tools and resources needed to construct their own knowledge, increases their mental activity, develops and improves the quality of their cognitive and metacognitive processes, and facilitates independent and autonomous learning. Furthermore, the students' reaction to the process of engaging in corpus consultation as a means of correcting their errors and potentially improving their writing skills were generally positive (O'Sullivan, 2006), suggesting that consultation of an appropriate corpus can provide a means for the learners to participate more actively in the development of their writing skills, and thus foster inductive learning methods. In this type of interactive feedback, the correction of the errors becomes an important and a positive stage in the language learning process, rather than being perceived as a means of highlighting students' weaknesses. The rich and challenging learning environment which corpus consultation nurtures may have also contributed to greater motivation on the part of the students and thus led to their positive reaction to the entire process. Comments such as "Good for 'unlearning' errors" display the depth of linguistic analysis,

processing, and problem-solving taking place when learners engage in corpus consultation, making the learning process a meaningful and valuable experience, while at the same time developing skills which are beneficial in other areas of language learning. It encourages students to regulate their own learning gradually, which facilitates independent learning. These ideas are related to the concept of learner autonomy which also emphasises the importance of the learners taking responsibility for their own learning and comprehension process. Subsequently, together these elements fulfil some of the fundamental principles of process-oriented instruction and provide a solid foundation for the integration of corpus consultation literacy into language learning.

However, this is not to cast aside the importance of product. Warschauer (2002) encourages a developmental perspective which focuses on a combination of both product and process, following on from the work of researchers such as Breen (1984), Candlin (1984), and Spada (1987), who recommend that we include both a product component and a process component in the language classroom. Although this research suggests that corpus consultation literacy can contribute to a process-oriented approach to language learning and teaching, its place within a product-oriented approach can equally be envisaged. This is evident in some of the aforementioned quantitative empirical studies, namely Stevens (1991) and Cobb (1997), which focus on the performance of the students. For instance, Stevens (1991) investigates the use of concordance-based vocabulary exercises as an alternative to gap-fillers. The students perform better on the concordance-based exercise which leads Stevens to conclude that, in order to reinforce learners' vocabulary, concordance-based exercises are a viable alternative to gap-filling exercises. Cobb (1997) investigates whether, how much, and under what circumstances concordancing can facilitate the learning of vocabulary in comparison to traditional learning tools. The results show significant improvements and greater lexical acquisition in the concordance conditions, thus enhancing the product component. It is therefore the belief of the present researcher that corpus consultation can enhance both a product and process-oriented approach to language learning, thus forming an important new literacy for language learners and teachers.

The students in the research studies do, however, experience difficulty during the corpus consultation process and make negative comments about this process. For example, the students' evaluations in O'Sullivan (2006) reveal both positive and negative reactions, suggesting that corpus consultation can be of help in a number of areas, but that, for various reasons involving training and the availability of corpora and the tools to analyse them, it does not automatically solve all language learners' problems. Römer (2006) suggests that corpora and the tools to analyse them are only making their way very slowly into language classrooms because there is a dearth of corpora which are perceived to be pedagogically useful, and a lack of "easy-to-use, appealing concordance program[s]" (*op. cit.*: 127). Nevertheless, progress is being made, and further research such as that presented here, which strives to grasp an understanding of the theoretical and pedagogical context in which corpus consultation literacy can be developed, will help bring research in corpus linguistics closer to practices in the language classroom.

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