

Web-based second language grammar development: Researching the options

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Abstract

This article describes the work completed after one year of a three and a half year research project designed to study the effects of purposeful interaction on the Internet on the grammatical accuracy of French immersion students in two Australian high schools. The two schools adopt different approaches to the teaching of grammar, one integrating it with the immersion subject-matter content, while the other teaches it as a discrete subject. To date, one of the schools has been linked with schools in France and Canada to produce a web magazine containing articles written collaboratively in French (by the Australian and Canadian students) and English (by the French students). The other school is to be linked in 2000. A number of web tools have been developed which allow the researchers to monitor the students' interactions during the process of arriving at publishable articles. This article describes the use of a range of research instruments developed to gather project data and explains how the data will be used to address the research question: What is the effect of purposeful interaction via the Internet on the grammatical accuracy of foreign language learners?

The rationale for the project: Immersion, consciousness-raising and the Internet

Immersion programs in which a foreign language is used to teach regular subject matter (such as social sciences, maths, sciences, etc.) have been very successful in achieving high levels of foreign language proficiency, without having negative effects on the students' progress in the subjects taught via the foreign language (Chappell & De Courcy, 1993; Genesee, 1987; Krashen, 1984). However, while immersion students out-perform students taught by other approaches, in terms of grammatical accuracy and sociolinguistic appropriacy, their language use falls short of native-speaker norms (Harley, 1984; Hammerley, 1982; Lyster, 1987). It has been pointed out (Lyster, 1987) that this is because students communicate for the most part with their peers who are at a similar level of target language proficiency and with teachers who often overlook grammatical errors if the student's subject matter is correct.

In the past, many approaches to the teaching of grammar in immersion programs have been trialed. Day and Shapson (1991) experimented with the teaching of functional grammar and recorded some initially promising results. However, for six months, the students involved did not maintain their initial advantage over a control group. Lyster (1994) developed an approach that attempted to raise students' consciousness of correct

grammatical form which resulted in some positive outcomes. Davies (1995) has developed a “dual-focus” approach, which explicitly teaches grammar in tandem with the subject-matter content of the immersion program.

In arguing for the importance of interaction with native speakers, Valette (1993) contrasted the accuracy of students who learned French in French government lyc_e schools with the flawed accuracy of immersion students. Swain (1993), in emphasizing the important role of output in the language acquisition process, highlighted the opportunity that interaction provides for learners to test hypotheses about language rules and consequences to modify their language in the direction of native-speaker norms. It would seem, therefore, that if students are to monitor their performance and to refine the grammatical rules on which they operate, they will be assisted if allowed to interact regularly with native speakers. Furthermore, Swain (1998) maintained that student production of output promotes consciousness-raising as it puts students in the position of noticing the gap between what they can say and what they cannot say, helping them to become aware of their degree of knowledge of the target language.

The geographical location of Australia makes interaction with native speakers difficult, especially in those languages such as French where immigration of native speakers has been limited. For this reason, it is relevant to explore the use of new technologies, such as email and the World Wide Web to establish whether the access that they allow foreign language learners to native speakers and immersion students in other parts of the world impacts positively on the development of the learners' grammar, particularly as it is revealed in their written language.

Studies of the use of e-mail and the Internet (Boggs & Jones, 1994; Carrucan & Crewe, 1996; Chun, 1994; Cooke, 1996; McWhirter, 1996; Hogget, 1996;) have found that students experience a range of benefits, including intercultural understanding, greater awareness of audience, the development of critical thinking and an increase in written production. In addition to registering improved motivation (Warschauer, M., Turbee, L., & Roberts, B., 1996), it has been suggested (Bonk, Medry and Reynolds, 1994; Cavalier, Klein & Cavalier, 1995; Forman, 1994) that students experience enhanced achievement through access to peer feedback and discussion by Computer-Mediated Communication (CMC). This applies particularly to the development of writing especially when interaction occurs with more capable peers, a feature that is particularly relevant to the use of CMC to provide contact with native speakers and other learners of a foreign language.

Reports from the foreign language classroom (Barson, Frommer & Schwartz, 1993; Oliva & Pollastrini; 1995; Poyatos, 1996) have confirmed learning outcomes similar to those documented from regular classrooms. Oliva and Pollastrini (1995) conclude that Internet resources, when used to allow students to communicate with native speakers, are conducive to fostering second language acquisition. Moreover, the language teachers involved in these projects have suggested benefits in all language skills including the development of grammar, and it has been found (Kern, 1995; Warschauer, 1996) that students' linguistic output has been more complex at lexical and syntactical levels than when they are engaged in face-to-face interaction.

In recent years, a growing body of research has suggested that conscious reflection on learning may contribute to positive learning outcomes through the development of learner autonomy (Ellis, 1994; Little; 1996; Rutherford, 1987 and Van Lier, 1996). Furthermore, the research studies of Lamy and Goodfellow (1999) have suggested that

“learners engaging in reflective online conversations may be more likely to notice formal features of the target language than they would in other kinds of exchanges” (p. 60). However, despite considerable speculation concerning the benefits of the use of email and the Internet for the development and acquisition of grammar in foreign language learners, there are no empirical studies based on consistent longitudinal data collection which describe the efficacy and implementation of different grammar teaching and learning approaches with or without the support of Computer-Mediated Communication.

The aims of the project and their evolution

This longitudinal study started in February 1998 and will be completed in 2001. The first two stages of the project have been completed and that is why they are being reported in this paper, as they provide relevant information about the research design and initial implementation of this study. The initial aim of the research project was to compare two broad approaches to the improvement of the grammatical accuracy of students in French immersion programs. One approach involved Australian students in a French immersion program interacting with students in France and Canada via email and the Internet to produce a collaborative electronic magazine. The other approach involved another group of Australian French immersion students receiving explicit grammatical instruction integrated with content subjects in the immersion program.

However, it was found that to respect the pedagogic integrity of one of the participating schools, it was necessary to broaden the scope of our investigation. It was found during the pilot stage that the school that was to use only the Internet was teaching French grammar classes that were not integrated with immersion content subjects. As a consequence, the initial aim was changed to document and assess the influence that four different approaches to grammar teaching and learning may have on French immersion students' grammatical and written development.

These approaches are:

1. Grammatical instruction as a discrete study in an immersion program.
2. Grammatical instruction integrated with content subjects in an immersion program.
3. Grammatical instruction as a discrete study in an immersion program together with interaction with native speaking peers and other immersion students via the Internet to produce an electronic magazine.
4. Grammatical instruction integrated with the immersion content subjects together with interaction with native speaking peers and other immersion students via the Internet to produce an electronic magazine.

The research design and methodology

The participants and the data

The participants are Year 9 and 10 students and their teachers from two French immersion high schools in Queensland, Australia. Both quantitative and qualitative data were collected.

Quantitative data is being drawn from written tasks undertaken at six-monthly intervals by all the Australian immersion students involved in the project. These tasks are being analysed in terms of the number of words, t-units, and clauses used, together with the ratios of error-free t-units to total t-units, words, and clauses. These statistics have been chosen to capture the development of overall trends in both fluency and accuracy throughout the project.

Qualitative data has been drawn from six students and their teachers from each class at the Australian end of the project. This involves interviews at six-monthly intervals, classroom observations, and the collection of written work produced by the selected students together with the feedback they receive from their peers in Canada and France and the modifications to their articles that result from this. In addition, the feedback that these students give to their French and Canadian peers is being documented.

This data collection is facilitated by the following web tools, which have been specifically designed for the project:

1. The tableau de communication pour r_diger into which the students write drafts of their articles and receive feedback from their international peers;
2. The tableau de communication pour r_viser through which students read drafts of articles produced by their international peers and provide these peers with feedback;
3. The user-tracker which allows the researchers to gather data on how the students use the virtual learning environment.

These devices provide the researchers with a permanent record of the students' interactions and the relationship between feedback and the development of written proficiency in a way that would not have been possible had e-mail been used as was originally intended. They also allow relationships to be explored between the language of the written tasks, which are generated individually under test conditions, and the written articles generated collaboratively.

Stages of the data collection

The data collection of this longitudinal study started in July 1998 and will be completed in December 2000. Due to the complexity of the project, the data collection has been divided into four stages:

- Stage one: Piloting of research tools and methodology between July 98 and December 98.
- Stage two: Data collection between January 99 and June 99 (See Figure 1)
- Stage three: Data collection between July 99 and December 99 (See Figure 2)
- Stage four: Data collection between January 2000 and December 2000 (See Figure 3)
- Stage one: This stage was used to develop and trial the research tools and procedures to be used in data collection These consisted of:

- Student written tasks to gauge the development of grammatical accuracy during the project.
- Computer Mediated Communication using tableaux de communication.
- Student written contributions to the WWW magazine.
- Classroom observation instruments.
- Teachers and students interviews to gain insights into teaching and learning processes, as well as computer knowledge, attitudes, and grammar learning experience.
- Website user-tracker to provide an insight into which of the Website resources and tools the students use.

Technical and procedural problems were detected at this stage. On the technical front, it had initially been planned to create a Website to display students' web articles in progress as well as to contain web resources to support the creation of articles for the Web magazine. It was intended to use a separate email package (such as Eudora) to have students exchange feedback on their articles in progress, and to use the Website to display them. However, it was soon realised that this was not the best technical design for the study and that it would be very difficult to deal with different countries possibly having different operating systems and email packages. Also, the students would have had to learn to use a range of different applications (e.g. a web browser and email software). Even more significant was the difficulty that the researchers would have experienced in keeping records of students' email exchanges and the sequence in which those exchanges were generated with the development of the articles. Furthermore, there were procedural limitations as the provision of feedback among students using different email packages was not going to be clear due to the use of different packages creating difficulties for both teachers and researchers in the coherent monitoring of the students' progress.

To solve the problems detected with this initial formative evaluation, changes were implemented to the initial research design and a tool was developed which allowed the participating students and teachers to view student articles in progress and to provide written feedback for the authors (See Figure 7). Two web spaces were created on the website. In the first one, students could upload their articles in progress directly into the website (called tableau de communication pour r_diger). In the second webspace, students could read and comment on the web articles in progress from international peers (called tableau de communication pour r_viser). In addition, this tool facilitated the maintenance of records of the students' written exchanges and the use that the different participants made of the site.

- Stage two: Data were collected between January 99 and June 99 from both Australian schools. These were drawn from written tasks administered at the beginning and end of the semester, which was analysed to provide indications of the students' fluency and accuracy. In addition, classroom observations were carried out to document the teaching approaches used in each school and student and teacher interviews took place. Interaction with peers in Canada and France did not take place during this stage (See Figure 1). However, students in School A1 (grammar instruction as a discrete subject) were introduced to the instruments and procedures that were to be used in preparation for their going on-line in the project's next stage.
- Stage three: Data collected between July 99 and December 99 (See Figure 2). Data were collected from grades 9 and 10 in the Australian School A1 where interaction

began with immersion schools in Canada (CA1 and CA2) and schools in France (FR1 and FR2). The data collected included students' written tasks, students' and teachers' questionnaires and interviews, classroom observations, Web input (articles and greetings), and user-tracker reports. In addition, data collection continued from grades 9 and 10 of the Australian School A2 (grammar integrated into subject matter content). However, this school was not linked to French and Canadian schools at this stage. Instead, this stage of the project was spent familiarizing the grade 9 students with the web tools that they are to use during the next stage.

- Stage four: Data will be collected from students' written tasks, students' and teachers' questionnaires and interviews, classroom observations, Web input (articles and greetings), and user-tracker reports between January 2000 and December 2000 (See Figure 3). In this stage interaction with Canadian immersion students (CA3 and CA4) and native French speakers (FR3 and FR4) will be introduced in grades 9 and 10 of the Australian School A2. The collection of data from grades 9 and 10 in the Australian School A1 will continue as will its links with the schools in France (FR1 and FR2) and the Canadian immersion schools (CA1 and CA2).

The data collected up to the end of the year 2000 will be analyzed using a combination of both quantitative and qualitative procedures and the final project report will be completed by July 2001.

Cyb@mis: A virtual educational environment

By the end of the project, both Australian schools will have their website to host the international magazine developed in collaboration with their overseas sister schools in France and Canada. The first website has been already developed by the students and teachers of the first Australian School and has been named Cyb@mis (<http://www4.gu.edu.au/arts/mans/index.htm>). A perusal of the site will show that it is a virtual educational environment (See Figure 4). For this article, however, it is intended to highlight only those features which contribute to the provision of data that will elucidate the project's research question.

Tableaux de Communication: The process

Central to this purpose are the tableaux de communication (See Figure 5). They have two roles in the provision of relevant research data:

- Output generators: The tableau de communication pour r_diger allows the students to demonstrate, and the researcher to monitor, the development of their emerging interlanguage as they respond to the feedback of their international peers.
- Feedback generators: The tableau de communication pour r_viser enables the researchers to observe the students as they demonstrate their conscious knowledge of grammar, both French and English. It allows the investigation of possible links between this conscious knowledge and the students' performance in the language.

Le Magazine Cyb@mis: The product

Once students are satisfied with their articles, they may publish them in Le Magazine [Cyb@mis](#). Up until now their drafts (See Figure 6) have been confidential and available only to their teachers, the researchers, and the peers with whom they have been paired for feedback. Once they decide to publish them their articles have a potentially worldwide audience. It is considered that this is likely to exert a strong motivational force to achieve the highest level of proficiency of which they are capable. Through access to the tableaux de communication, it will be possible for the researchers to trace the stages that the students go through in reaching this level of performance.

Interactional Rules

A further important feature of Cyb@mis relates to the interactional rules that have been developed for the use of the tableaux de communication. As the final product of the collaboration between the students is intended to be a bilingual magazine, there is a need to ensure consistency and coherence of input and output. A simple rule has been devised that students write articles only in their foreign language and that feedback is given in the language in which the article is written. Australian students will, therefore, write all their articles in French, as will Canadian students. However, when they give feedback to French students, they will do this in English but will write in French when providing feedback to Canadian students. The availability of this feedback data to the researchers through their access to the tableau de communication pour r_viser will allow the investigation of links between feedback provision and the recipient's language as well as studying its effects on the provider's language (See Figure 7).

The future of the project

The first two years of this project have provided us with very useful insights from our initial formative evaluation to improve the methodological aspects of the research design and to redefine our research questions as described in this article. This international project is an example of how technology can be used as a tool to gather linguistic data, as well as how to use it to enhance the students' linguistic and social learning environment, breaking the barriers of time and distance.

Now that we have overcome the initial challenges of setting up this computer-mediated interaction project between Australia, Canada, and France, we will be able to concentrate fully on gathering and analysing the data that remain to be collected. The outcomes of this project will allow us to document and assess the impact that different approaches to grammar learning and teaching may have on French immersion students' grammatical and written development. Finally, this longitudinal study will allow us to provide new insights into the effects that purposeful computer-mediated interaction with native speakers and other second language learners, via the Web, will have on the process and outcomes of second language acquisition.

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