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Computer Assisted Learning for Young Bilinguals

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Abstract

Few educational systems have been developed to specifically address the needs of young children who are acquiring two languages at the same time. In this paper, we present a prototype of a CALL (Computer Assisted Language Learning) system for English and Japanese bilingual children aged between 6 and 8. The prototype recreates a bilingual learning environment and was tested with 4 bilingual children and 8 language teachers. The study indicates that a CALL system appropriately designed for bilinguals can help children achieve balanced bilingualism and biliteracy.

Introduction

Bilingualism is extremely common around the world. Some nations, for example Canada and India, are officially bi- or multilingual. However, most bilinguals do not live in bilingual countries and most of them receive very little support in achieving bilingualism. The acquisition and development of bilingualism by children is in fact a complicated process that requires a lot of commitment from both the children and the people who influence them linguistically (Taeschner & Volterra, 1978). The term balanced bilingualism is often used to describe individuals who, compared to monolinguals, possess about the same level of fluency in two languages. For a number of different reasons, few people are truly balanced bilinguals: one language is usually dominant, at least in some aspects of language use (for example reading), or in some specific domains (for example in the domain of professional activity) (Bialystok, 2001). In bilingual children, this imbalance is often linked to an imbalance in the amount and/or quality of input that they receive in each language (McLaughlin, Blanchard & Osanai, 1995). Moreover, when one language is used at the exclusion of the other in some specific domains or for some specific purposes, a specialization of the languages operates: each language becomes specialized in the domain in which it is mostly used. For example, a bilingual child may be fluent in the minority language for speaking with his or her family about family matters, but functionally unable to use the same language to talk about school matters. Finally, literacy in one language rarely develops without formal education (Cummins, 1989). When formal education is exclusively provided in the majority language, literacy in the minority language is not achieved.

Recent studies have shown that bilinguals may have cognitive advantages over monolinguals (Bialystok, 2001) and that cross-linguistic transfers operate concurrently between learnt languages (Odlin, 1989). Despite this, bilingual education is often considered a controversial issue (Baker, 2001). In addition to the lack of formal bilingual education, it is also surprising to note that few attempts have been made to develop educational tools specifically designed for bilinguals. Typically, multilingual families and communities rely on a multiplicity of independent and ill-adapted educational tools, each of which addresses only one of their children's languages and cultures. For example, CALL (Computer Assisted Language Learning) systems for first or second language acquisition have gained a tremendous momentum, following the recent developments in multimedia personal computers' capabilities and interconnectivity. But unfortunately, in current CALL systems, the world is still essentially a monolingual world where children are not expected to exhibit a variety of proficiency levels in several languages.

The purpose of this paper is to contribute ideas towards the development of CALL systems for bilinguals that recreate the richness and complexity of a multilingual learning environment. First we outline the requirements for a bilingual CALL system, and then we propose a new CALL paradigm (the "OCOL model") and a prototype implementation. Finally, we present the results of a preliminary study on the OCOL model and the prototype's use.

Call for bilinguals

Ideally, a CALL system dedicated to bilinguals should use the same level of linguistics in both languages throughout the application. Children should be assumed to be native speakers of both languages. According to the cross-linguistic transfer theory (Odlin, 1989) bilingual children will improve by transferring knowledge and skills from one language to another. The software should also contribute to correct the imbalance between the amount and/or quality of input that children receive in each language, and children should be encouraged to extend their vocabulary into domains in which they typically use only one language.

A new CALL paradigm: the OCOL model

OPOL (One Person One Language) is a popular strategy for bringing up bilingual children (Harding & Riley, 1986). In OPOL families, each parent speaks one language to their children, usually their own native language. While OPOL always works well in one-to-one parent-child situations, in whole-family interactions it only works if all members of the family have at least a passive knowledge (i.e. a good understanding) of the two languages. When the approach is maintained during whole-family interactions, it results in situations where different people speak different languages within a single conversation. The "OCOL" (One Character One Language) model is an attempt to imitate the OPOL strategy in educational software (Bourguet & Plaha, 2004). The main concept in OCOL is the implementation of several software characters, each speaking to the other characters in their own language. An important assumption in the model is that all characters do understand the languages used by others. The characters are taking the roles of the parents of an OPOL family, whereas the children playing with the software get situated in their own personal role of the bilingual child, in which they are expected to use both languages.

Prototype

For the purpose of testing the OCOL model, a simple prototype was developed for English and Japanese bilingual children aged 6 to 8. The OCOL prototype is implemented as an easily downloadable Macromedia Director application and constitutes a simple demonstration of the main OCOL concepts for preliminary evaluation purposes.

The system is designed as a story and the plot features two children: a bilingual boy from England named Bob and a bilingual girl from Japan, named Aiko. According to the OCOL model, Bob always speaks English and Aiko always speaks Japanese. On entering the system, the bilingual child is given two options: go to England, where Aiko will be guided by Bob, or go to Japan, where Aiko will be a guide for Bob. In each country, the child can then choose to explore Bob's or Aiko's school or home. Dialogues are implemented between Bob and Aiko, where vocabulary in both languages is used to talk about the relevant domain (i.e. school or home). To further differentiate between the languages, a male voice for Bob and a female voice for Aiko are used, and each language is printed in its own colour: English always appears in blue and Japanese always in red. As the child is given an interactive 'tour' around the country of their choice, exercises are integrated into the story, e.g. vocabulary exercises to learn about what is found in a typical Japanese home. Each story is followed by literacy exercises that exploit the vocabulary just learnt. For example, the popular card matching game is adapted to the multilingual environment: a word card in one language is shown and the child has to turn over other cards to find the corresponding word in the other language.

Evaluation method

The OCOL model was tested with the help of 4 children and 8 teachers, in a Saturday morning Japanese school in London (U.K.). As stated earlier, the purpose of this small scale, preliminary evaluation was to test the OCOL concepts in order to guide the design and implementation of a more thorough bilingual CALL application. The children were all from bicultural OPOL families, they were bilingual in English and Japanese and aged from 6 to 8 (average: 6.5 years). All of the teachers were native Japanese speakers, with good knowledge of English, who had taught bilingual children (of the age group tested) and two of them had taught the aforementioned children. The children's average level of speaking was excellent in English and good in Japanese. The average level of reading and writing was from average to good in English and low in Japanese. Both the children and the teachers were observed and asked questions while using the OCOL prototype. They were explained beforehand what the purpose of the system was, but were not given demonstrations. Each observation lasted, on average, 15 minutes. While observing the children, we focused on the following: Do they go to the domain they are less familiar with (home versus school) in a given language? Do they navigate easily in the system between countries and domains? Do they get confused between the languages? We also asked them the following: What did they like most? Did they learn more from the system? Did they enjoy using the system? Was it easy to use? To teachers, we asked the following: How does the system differ compared to current systems offering English and/or Japanese? Would the children be confused between the two languages in the application? In their opinion, would the children instinctively look for elements they do not yet know or would they go to the more familiar elements first? Are the cultural elements appropriate? Would the children learn more from such a system?

Results

All of the children were more confident in English than in Japanese. When the children tested the system, three out of four of them went to England first, their most familiar country. We assume that they wanted to explore a familiar territory first, rather than go somewhere where they might not feel as comfortable or confident. Some children who could not read any Japanese yet may also have been intimidated at first by the Japanese text. However, it was surprising to see that even though all the children were dominant in English, they all clicked on both languages when navigating round the system. This could be explained by the fact that they could easily guess the meaning of the Japanese words, given the context of the story, the visual aids provided and the surrounding English text. The teachers commented that having pictures, audio and text together in both languages was a good idea. One teacher gave a rather technical view on this. He said that if the child uses the computer over a period of time, the Japanese words would eventually become "sight words". This means that after hearing and seeing a word repeatedly, the children will not have to keep breaking the word down for decoding and will be able to read it fluently. The children were not told that the text was colour coded (English: blue, Japanese: red), but, as expected, they did rapidly notice it.

When the children were asked whether they had learnt more from a system like this, it was suggested that they compare it to how they presently learn both languages; their traditional way of learning is in the classroom using conventional pencil and paper methods. The answer that they gave was rated on a scale of 1 to 10, with 1 being nothing more, and 10 being a lot more. On average the score was 3.75. This is much lower than expected, but it might have been hard for a child to make this sort of comparison if they had not used the system over a longer period of time and have their teachers/parents assess the effects. One interesting comment made by one of the children was that they liked the fact that their work was marked immediately and did not need to wait for a teacher to do it.

All the children enjoyed using the system and the average rating was 9.75 (measured on a scale of 1 to 10 with 1 being no; 5, I do not know; and 10, yes). The average ease of use rating was 7.5 (on a scale of 1 to 10, 1 was hard and 10 was easy). This is quite high considering these children were inexperienced with using a computer. Two of the teachers who had used CALL before commented that the OCOL system was different from any other system they had seen because of the use of two languages, side by side. They felt that this is a much better way to teach languages because in the real world, bilingual children are exposed to both languages, often at the same time. Three teachers mentioned that having a language teaching system on computer makes it easier for the teacher to assess the children. Since the system lets the user know if an answer is correct, teachers who do not know the two same languages of the bilingual child can still determine what the child is learning and how they are progressing. All teachers supposed that the children would not get confused between the two languages and had different opinions on why. Most thought this because of the different coloured text in both languages and the dissimilar characters of the alphabet of both. They were then asked to give their opinion on a situation where the two languages are based on a Latin alphabet. They responded that the two colours would make them distinct and the children would still not get confused. One teacher responded that the phonetics and structure of every language are very different and that children would realise this and not mix the languages.

On the question about whether the children would look for elements they do not yet know or go to the more familiar elements first, the teachers had differing opinions; 50% thought that the child would first go to less familiar elements and 50% thought the children would go to elements with which they are more accustomed to. On one hand, it was thought that the children would look for elements that they already know and could relate to, in search for an environment that would make them feel comfortable and secure (in this case England). On the other hand, the reasons for why children would go to Japan were convincing as well. In particular, it was said that if the children had never visited Japan before, then they would want to explore it. A teacher also said that, if the children were aware that the system is a tool to teach, they would go to the country with which they are less familiar. All teachers thought that including cultural elements into a system that teaches languages was a very good idea since children will be able to see the differences between the two countries and compare them. It would also be useful for them to know about a country, which they had never visited before, to strengthen their interest in the language. The teachers also commented that culture consists of many components, which include languages. It is therefore impossible to learn one without learning the other.

The teachers were also in agreement about the last question - whether a bilingual child would learn more from a CALL system designed like this. The average rating was 8.75 (on a scale where 1 was nothing more and 10 was a lot more). Two teachers commented that this type of system would be more suitable at home rather than in the school environment because, in reference to OPOL families, the system imitates a home environment.

Conclusion

The aims of a CALL system for young bilinguals should be to overcome the imbalance of knowledge that a child has of two languages and to develop biliteracy. The study we presented in this paper shows that the OCOL model constitutes a good step toward achieving this goal. Providing diverse situations where children may use their languages corrected the imbalance of knowledge that a bilingual child may have of two languages. This meant that children would be able to use their

weaker language in unfamiliar domains. From the testing it was clear that even though children may choose to go to a domain with which they are most familiar at first, they will eventually explore the whole system. Finally, the teachers who teach bilingual children approved the OCOL model. In particular, they thought that it would help the assessment of bilingual children progresses, even in situations where the teacher cannot speak the two languages.

In the near future, we plan to implement a more complete version of the OCOL prototype that will include more diverse cultural elements (for example from other English speaking countries), and more domains of language use such as the visit of museums and local attractions. This more thorough prototype will then be the subject of a larger scale evaluation. We are planning to make this future prototype available for download and distribute it to children and teachers at Saturday morning Japanese schools in England and in the United States and at Saturday morning schools for so-called “returnee children” in Japan. These schools are providing Japanese language support as well as English language maintenance classes to (mostly Japanese) bilingual children who have recently moved back to Japan.

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