Adaptive Learning for Very Young Learners

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Abstract. The use of Information and Communication Technologies (ICTs) is spreading inside the classrooms at all educational levels. As this integration has extended to young learners (3 to 5 years), the authorities have recommended their use so that children can acquire knowledge and dexterities they will use all their lives. Keeping in mind that it is at this age when very young learners acquire abilities and basic dexterities at their own pace, the more personalized the better. From all the premises above, we can claim that whereas other computer assisted language learning systems do not account for differences in children’s cognitive development when designing computerized applications, the introduction of AHS (Adaptive Hypermedia Systems) is aimed at adapting and personalizing content to children’s needs and abilities.

1 Introduction

Nowadays, ICTs are a common resource used in all educational levels as a way to improve and enrich the teaching process.

However, the effective incorporation of ICTs in the classroom and the suitable use of educational software for early ages is not exempt from important challenges. In this period, children have not developed yet all the language and cognitive abilities that older learners have. These circumstances demand from the system an exclusively visual interface and require, in addition, previous training in the use of computers and input devices (mouse and keyboard).

According to Haugland [1], the appropriate use of computers as well as the educational software may increase creativity and self esteem in children. He also claims that children exposed to software that tends to boost their development may successfully increase their intelligence, verbal /non verbal skills, visual and movement related abilities, structural knowledge, long term memory, problem solving, decision making, abstraction and conceptual formation skills. On the contrary, the uncontrolled use of ICTs in the classroom could infer a negative impact on children.

Thus, it is necessary to consider several factors which could affect the successful integration of ICTs in pre-school education [2]: how to integrate the computer in the classroom, the features of the educational software at these ages, the use of adequate input devices, the interaction styles and the teacher's active role as organizer of the learning process.
We claim that an adaptive hypermedia system adapts to young learners’ educational software demands because:

- Thanks to their hypertext structure, the necessary level of freedom is achieved so that the children develop their curiosity and explore the knowledge.
- The multimedia tasks provide the necessary motivation to make children feel attracted by software content [3].
- The intelligent tutoring system carries out the adaptation to the student's characteristics, which provides a personalized teaching and adaptation to the level of the student's knowledge, as well as to the student's learning style.
- It is also in charge of providing the necessary support and help to reach the learning objectives.

2 Adaptive Hypermedia System for Children

Our objective is to use ITCs for teaching a foreign language at early ages. Bearing in mind the considerations dealt with in the previous section, we seek, therefore, to develop an AHS for English teaching in pre-school education (3 to 5 years). This system will be a Web-based system, since the election of Web-like development of adaptive platforms in educational hypermedia is becoming standard. [4] This environment allows the teacher to carry out observations and evaluate all the students. In addition, not only do we seek to develop an AHS, but also evaluate the use of ICTs at early ages and the benefits derived by adapting to this type of user and evaluate which Web platform will allow us to know the results of the children’s interaction with the system.

Adapting to children is different to adapting to adults because children at this age still cannot read or write and most AHS are text-based systems. Also, in this period children have not yet developed all the language and cognitive abilities that older learners have.

Under the name of SHAIEx (Adaptive Hypermedia System for English learning at pre-school in linEX), this system is being designed to integrate information technology in relation to certain learning traits at early ages. From the whole system, we have already developed the following phases /subsystems:

- **Content and structure of the pedagogical domain.** The content consists of nine didactic units and comprises points of interest of Infant school. The didactics units have been elaborated starting from preschool curriculum, books and surveys to the teachers. The decomposition of each didactic unit in blocks of multimedia activities and the dependency among them is based on the task-based paradigms[5].
- **User model.** For the adaptation, SHAIEx stores the following child's characteristics:
  - Educational level: For 3, 4 and 5 years will be the corresponding levels 1, 2 and 3, based on the curriculum for infantile education. The different levels are associated with the contents of the curriculum, which implies that a 3 year old child, for example, can be in level 2 or that a 5 year old child begins from level 1. Because multimedia activities are addressed to heterogeneous groups of students, such tasks should be developed by accounting for all students’ needs and preferences.