PERSONALIZATION IN HYPERMEDIA LANGUAGE ASSESSMENT

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Abstract: Protocol technologies present a wide range of challenges for educators and learners, from course design to teaching practices to assessment. Having moved beyond traditional teaching approaches, hypermedia, enhancing a more goal directed learning format, grants people the chance to learn greater amounts of information more quickly. In this context, academia needs to know how learning can be effectively measured in technological environments. Regardless of the answer, it is essential to develop evaluation systems that support all kinds of teaching and assessment practices. With this aim in mind, this paper proposes two assessment methods which may best suit language learning in online environments: first, architecture providing personalization services for adaptive educational hypermedia, and, second, the online portfolio to measure performance based on collections of student-created work.

1 PERSONALIZATION

Personalized learning is receiving growing attention from policy makers, theorists and practitioners in order to properly address teaching different things to different people (Sebba & Brown, 2007).

All too often, formal schooling is ruled by policies based on the premise that most educational problems are solved by a powerful testing system. Such a system is rarely personalized as the tendency is either to punish or reward students by simply measuring high or low performance. Standardized assessments aim at completing standardized test packages based on concepts like overall reliability and generalizability (J. D. Brown & Hudson, 1998). Both notions indicate universal evaluation measurement references rather than individualized ones. However, every learner's education and personal background can be developed by attending to his/her unique set of abilities, interests and needs, and, by analogy, evaluating this type of learning.

Personalization thus, allows learners to obtain information as adapted to their personal characteristics. The first of these features is identification of the user model employed to deliver the main parameters for selecting and adapting the information presented, and ultimately, evaluating it.

The concept of personalization means that the individual is the center of the learning process. Friedrichs & Gibson, (2001) claim personalization consists of general competence concerned with authenticity, the use of technology and the creation of personalized problem-centered approaches.

Personalization in e-learning and technological environments is currently a central issue challenging the area of adapted learning, where multiple parameters like context, methodology, content, computer interaction, teaching/assessment practices etc. are involved. Supporting personalized learning in hypermedia environments requires, however, expertise and coordinated efforts throughout the whole learning process in order to improve efficiency, cost effectiveness, virtual collaboration

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and design of individualized learning paths. In essence, this means assessment procedures need be a mirror reflection of teaching-learning methods.

2 BACKGROUND

Hypermedia technology and educational virtual environments are increasingly being used to create instructional spaces for distance education. They encourage learners through the experience of visualizing concepts in order to carry out simulated real world tasks, Costagliola et al (2005) claim the use of visual language provides an intuitive and user-friendly interface for e-learning practices. Nonetheless, technologies present challenges for educators and learners, ranging from teaching methods to assessment protocols. Emerging applications include interactive simulations, hypermedia and virtual explorations, obliging teachers to reconsider teaching practices (Jacobson & Azevedo, 2008) by designing innovative online activities and devising evaluation procedures to assess avant-garde learning ways and means.

How then can learning be effectively measured in technological environments with a personalized perspective? Some authors contend that the limitations of classic assessment models should be replaced by new paradigms for assessment in online learning, pointing out the e-portfolio as one of the most feasible (Mateo & Sangrá, 2007). Others like Boboc, Beebe, & Vonderwell (2006) place special emphasis on the factors involved in highlighting time management, the complexity of the course content, and the structure of the online medium as variables influencing the design of assessment proposals. Other solutions are backed by those in favor of scaffolding self-regulated learning, metacognition and assessment in designing computer-based tasks (Azevedo, & Hadwin, 2005), or by scholars who advocate the intrinsic potential of Web 2.0 to support collaborative learning and facilitate feedback between teachers and students (Russell, Elton, Swinglehurst, & Greenhalgh, 2006). Despite a variety of possible answers, a cornerstone concept lies in developing evaluation systems to support all kinds of teaching and learning practices focused on collaboration, interaction, and, personalization in hypermedia teaching approaches.

In light of the discussion, it seems reasonable to conclude that for diverse kinds of virtual instruction, the conversion of conventional learning models into adaptive environments with hypermedia applications and online teaching platforms is but a must.

To pursue a form of evaluation rendering true face validity guaranteeing personalization in learner assessment processes, our paper advocates two methods of alternative assessment suitable for language learning in online environments: adaptive hypermedia and the online portfolio.

3 ADAPTIVE HYPERMEDIA: MEETING PERSONAL NEEDS, ASSESSING PERSONAL GOALS

Web-based assessment is widely used to support student learning and aids in achieving goals like self-assessment, peer assessment, and evaluation of the learning process itself (Grimon, Monguet, Fabregas, & Castelan, 2008). Such applications can be further enhanced when assessment is learner customized since individuals have different preferences, needs and wants (Brusilovsky, 2001).

Adaptive Hypermedia Systems (AHS) are those offering a computer-aided format for learning at the learner's pace, joining the virtues inherent to hypertext and multimedia as well as containing all kinds of multimedia material, i.e. text, sound, images, video, etc. Furthermore, AHS allows and invites the user to freely explore the available content (De Bra, 2006).

Thus, if adaptive hypermedia presents content adapted to the hierarchical and linear learning preferences of the user, and it delivers content which accommodates visual, verbal, and experiential learning preferences, then, it stands to reason that adaptation plays an important role in both increasing learning-effectiveness and in assessing personal abilities on the specific content.

Aspects of AHS adaptation, make it apparent that hierarchical and linear structure is fundamental (Kobsa, Koenemann, & Pohl, 2001).

The features of an AHS distinguish three types of data: *adaptation of user data, the data to be used,* and, *the data of the environment* (Kobsa et al., 2001). User data is identified as objects of traditional adaptation employing user's specific characteristics. The data of use houses information on user interaction with the system which cannot be otherwise solved by the user features. The data of the environment refers to all the aspects within the setting other than those related to the user. The three constituents make up a trio of elements conducive to personalized hypermedia language assessment.

GexCALL research group has developed an adaptive system for primary school children learning foreign languages through ICT (Rico, Agudo,

Edwards, & Cumbreño, 2007). Its architecture required multimedia task design adapted to the limited level of knowledge and special interaction styles of young target users (Agudo, Sánchez, Rico, & Domínguez, 2007). Six fundamental parameters make up the user model in order to adapt learning tasks to each individual child (Agudo, Sánchez, & Rico, 2006): the child's educational level regarding the pedagogical domain, knowledge acquired intra-process, psycho-motor capacity, foreign languages, textual information, and level of difficulty.

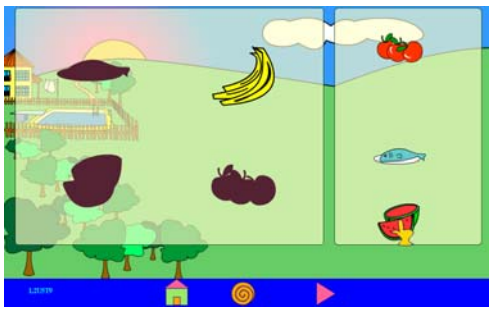

Figure 1: Evaluation Task example.

A sample task taken from the "Food" unit is illustrated in figure 1. The objective lies in identifying the foods introduced and then placing them in the correct position in the shaded silhouette on the screen. Technical details for the adaptation parameters corresponding to this task are listed in table 1, information collected from the user model.

Said parameters are transmitted to the Interface via an XML file storing all information needed to dynamically build the task.

Table 1: Task adaptation parameters.

PARAMETERS	VALUE
Educational level	4 year-olds
Knowledge	Level 1 passed
Interaction Level	Level 2 (Click move)
Language	English
Textual Information	No
Difficulty	Low (4 Elements)

4 PORTFOLIO ASSESSMENT: RECORDING LEARNER DATA

Barret (2002) defines electronic portfolios as a new kind of container providing an educational space for participants to store, share and organize learning. As a collection of personal student work, it houses drafts of learner development records over time, inventories focused on the process rather than on the product, etc. Portfolios provide learners the chance to show what they can do, they encourage students to be reflective learners, and they help them take on responsibility for their own progress. An added bonus clearly different from traditional evaluation methods, is that portfolios give both learners and instructors the chance to collaborate and reflect on work in the making as well as on the final product.

Portfolios use databases to collect observations of learning activities in or outside of classrooms, log learner task development and student interactions, including records of conventional performance assessments, grades, samples of student input and output, interviews with parents /teachers /tutors, and a very long etcetera (Chang, 2001).

In our adaptive system for primary school children, implementation of the portfolio data for assessment is a straightforward process. As the AHS stores the results of every learner task, detailed information is gathered on scores, correct answers, errors and how long it has taken the learner to complete each activity. The teacher can observe the exact task being worked on as well as specific information on tasks already completed.

Data recorded can be instructor accessed and referenced. The wealth of information available includes up-to-date records of how many tries are needed for an individual to complete a task, the resulting output of these efforts, how much work is yet to be accomplished and summaries of student output. The data not only provides an in-depth view of personal learning processes, it also indicates activities and concepts requiring reinforcement.

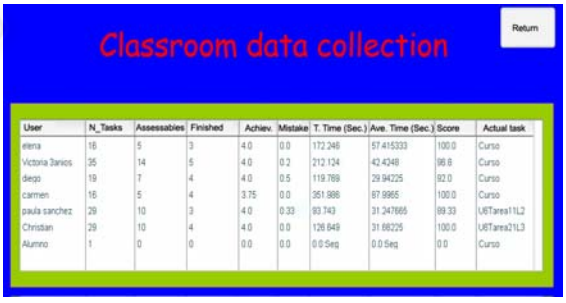

Figure 2: Global results.

Moreover, analysis of the group's global results (figure 2) shed light on learning aspects indicating complementary assessment factors applicable to personalization. Comparison with peer activity, relative class rankings, percentile ratings, means and averages, overall assessment of predominant task simplicity or complexity, dedication in terms of time spent on activities, among other findings, may serve to unravel inquiries that aid in personalizing learner assessment policies. For example, should the vast majority of learners encounter excessive difficulty

with an assignment, the resulting data may be calling for action regarding content or design rather than evaluation of student performance on that task.

5 CONCLUSIONS

To answer the question addressing the establishment of measures and methods for evaluating learning in technological environments, our proposal identifies adaptive hypermedia and portfolio assessment as specific evaluation models to efficiently support online teaching-learning practices.

The architecture of adaptive systems supplies important benefits to educational applications, like assigning grades in peer assessment, personally guiding students in their learning process according to their particular features, or helping them to make decisions related to their individual performance.

Online portfolio assessment uses both qualitative and quantitative techniques to provide reliability and validity within the assessment process in online teaching. By reporting on exploratory research into designing information systems for online portfolios, this paper also highlights the significant advantages online portfolio information systems offer in creating, distributing and assessing teaching to a wide range of stakeholders in ways far superior to other assessment solutions and tools.

The GexCALL system allows for adaptive learning and evaluation by implementing a portfolio that automatically tailors student completion of interactive educational activities. Forthcoming is the perfection of its interface to provide users with handheld devices, virtual touch whiteboards and video game consoles. The group user model will allow for group interaction in collaborative educational activities enriched by voice recognition.

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