Chapter 33
Serious Linguistic Games as Intelligent Tutoring Systems

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ABSTRACT

Serious games, especially word-based games, have long been popular in print and in modern computer games. Bringing serious word games into the classroom can be a simple distraction for an hour or two, or a comprehensive teaching, learning, and assessment strategy. There are major technical and pedagogical hurdles to integrating games into the common classroom. Firstly, the fact that some serious games attempt to emulate the scope and complexity of successful commercial blockbuster games but suffer from smaller budgets and development teams, making an otherwise excellent game seem lacklustre in comparison. Students are exposed to games that are not commercial successes, so they will become bored or frustrated unless the game is presented in a genre format that invites favourable comparisons with commercial games. The second hurdle is that word games that do not rely on the game mechanism of word spelling, but rather require linguistic data and meta-data about the word relationships.

INTRODUCTION

Assessing a student’s knowledge using games is an attractive idea to many educationalists because they wish to harness the dedication with which students play games and simultaneously turn a test into a fun activity that the student desires to experience repeatedly. Unfortunately, there are challenges to developing serious educational games in the classroom. The technical difficulty of creating a game brings to mind large development teams, art, model and sound assets, years of play testing and bug fixing before a game can be deployed. Few classroom professionals have the time or financial resources to commission a bespoke game, and companies who wish to provide
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games as a service may balk at the development costs and aim at the safer and more lucrative entertainment market. Furthermore, even if a successful game interface is developed, the issue of making the game educationally sound means that a database of subject matter information must be compiled. This requires a subject matter expert and is laborious to compile and prone to omission or error. Once the subject syllabus changes, then the entire database must be reviewed and updated. The necessary time constraints on compiling the material mean that the game assessments may not be repeatable, and the usefulness of the game is diminished.

Approaches to classroom teaching are gradually evolving, with most subjects still taught with a traditional instructional design methodology. This approach allows for standardisation of teaching materials and learning outcomes. Unfortunately, this approach does not foster exploration beyond the official subject guidelines and teachers can be viewed as interchangeable components as long as the official textbook is followed. An alternative approach to the instructional design methodology is constructivist design, which allows the learning process to be student led, with the teacher acting as a facilitator to learning that guides and steers the process, as opposed to a narrowly focused presenter of information. This approach does not suit all learners or teachers; it is time intensive for the teacher and some students prefer to learn by rote rather than exploration. Additional learning resources may be required and classroom or lecture time is reduced, because students will better avail of this time in the library or laboratory. For these reasons, few teachers embark on a constructivist design approach on their subjects, it is simply too risky without adequate support of additional teachers and learning resources such as supplementary texts.

With the preceding caveats in place, it is obvious that software that allowed a student explore a subject without constant teacher supervision would be a useful tool to employ in the classroom. Ideally, this software would allow a student explore a subject with a defined breadth and depth, and allow students with different learning styles consume the subject matter at their own pace. Assessment of the student’s learning can be problematic with a constructivist learning approach, leading many teachers to prefer elapsed projects for students. If software could be used to analyse a student’s exploratory progress through the subject material, or present them (periodically or on demand) with a test, this would alleviate some of the assessment issues. As some students will struggle with the subject material, while some find it straightforward, these assessments must be tailored to the individual’s abilities, and be pertinent to the aspects of the subject the student has explored.

Language instruction is an area that receives much research and analysis into what learning theories best facilitate both primary language and secondary language acquisition. Computer-assisted language learning (CALL) has been increasing as a method of language instruction for many years, growing from basic systems in the 1960’s that replicated classroom practice drill techniques to sophisticated collaborative learning systems (Warschauer & Healey, 1998). The growth of CALL systems has also seen constructivist theories become increasingly popular (Beatty, 2003). Building on CALL principles, computer games have been suggested as technology that readily fits all the requirements outlined above (Kafai, 2006).

This chapter describes the process of designing, building and play testing an educational computer game titled BuzzWords that assesses verbal-creativity. This serious casual game was intended to be simple to learn and engaging to play. BuzzWords was designed with a serious educational aspect, it required an e-learning framework that would present linguistic gameplay challenges and assess the player’s responses. In order to design and build a serious linguistic game which fulfils these assessment principles,