

Game based learning: a research on Learning Content Management Systems

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Abstract: - In this paper we present a study of the leading market Learning Content Management Systems showing what are the features that they offer. We also make a reflection on e-learning connected to the game-based learning theories, based on the results that some researchers are carrying out in this area, to finally give some reasons about the convenience of incorporating this pedagogical approach into these systems as another strategy to 'deliver' learning.

Key-Words: - Learning Content Management Systems (LCMS), game based learning, e-learning, Moodle

1 Introduction

The term e-learning covers a wide variety of applications and processes, including computer-based learning, web-based learning, virtual teaching and so on. As a result we could define the term as the use of multimedia technologies to develop and improve new learning strategies. However, the use of this concept and others associated, as technology-based learning or web-based learning changes, as well as the ideas behind, for almost every organization that uses them.

From some of the experiences studied [1], today the term e-learning could be understood in its most basic level as a course with text, graphics, exercises and evaluation through Internet. A more sophisticated level could include also, animations, simulations, videos and discussion groups, for example. However, all these approaches seem, in some way, an attempt to translate the usual magisterial class to the computers, taking, with better or worse fortune, advantage of the flexibility and capacity proportioned by those computers and the Internet. But, what would happen if the new technologies could help us to improve our pedagogical approaches in order to connect better with what the new generations of students are more willing to accept? What if these technologies had the power to increase our students' motivation as well as their skills with better percentages of utilization? In the following sections we will try to expose how a game based learning approach, as part of a Learning Content Management System, as well as the need of a measure system to track the performance of the students, could be another useful strategy in order to achieve these goals.

2 Game based learning

Historically the human being has been playing for ages, adults and children alike. There is evidence of game playing as far as 3000 years before Christ. So we can conclude that playing is a part of the human being.

In the history of games, computer gaming is a baby since it was not until the 1960's when video games began to be marketed. However, because of computer hardware prices and size decrease, together with the increase in the leisure time of people, the video game market has exploded and today is a fast growing industry throughout the world.

So why playing? Some of the reasons to play could be to have fun, to enter into imaginary worlds, to get in touch with other people, etc. And why using games to learn [2]? The main reason appears to be that computer games seem to motivate people in a way that formal education doesn't. In practical terms, formal education is usually beset with "demotivators" [3] of one sort or another, ranging from unhelpful administrative procedures and poor communication, to teachers' distracting mannerisms, students cultural lacks, and, of course, the lack of coverage of basic needs [4] because students will be scarcely concerned about learning if they are cold, hungry, etc.

Today new generations have been born into the image era. More and more people are accustomed to use computers. A significant percentage in the so called "first world" has a computer-based game device (although that could rapidly change if the M.I.T. initiative [5], among others, to provide people in developing countries with cheap computers

succeeds). Many researchers claim the benefits of video games:

- New generations learn faster and in a different way [6].
- Through informal games play, children learn several principles such as achievement, practice, intuitive knowledge, incremental learning, discovery learning, cultural models about the world and learning, to create affinity groups [7].
- Games change learners' cognitive skills so that the game generation can process a lot of information at the same time [8].
- Improvement of deductive reasoning, an important science skill [9].
- Improvement of organizational strategies (paying attention, self-evaluating, and self-monitoring), affective strategies (anxiety reduction and self-encouragement), memory strategies (grouping, imagery, and structured review), and compensatory strategies (guessing meaning intelligently) [10].
- Video games help students socially since the process of playing a game usually involves social interaction [9], [11], [12].

On the other hand, already some experiences and studies that try to prove the benefits of this approach to learning delivery have been carried out. For example, the TEEM report [13], the Becta report [14] and Pivec and Dziabenko [15], suggest that the key benefits of using games are in the areas of skills development, team working, participation and motivation to learn. That is, the game learning strategy appears to be successful in areas where interdisciplinary knowledge is necessary and where skills such as critical thinking, problem solving in a group and social interaction are of importance.

Another study [16] throws an important conclusion: the use of games in education is perceived as a useful tool for learning, also within the university community. Moreover, learning games may be an effective tool to help students become independent learners. In fact, according to Lim, this strategy worked specially well with disciplines that contain difficult content or numerous facts because the learner is challenged by the game, compelled to play longer in order to win and therefore has a better knowledge of the content.

On a more "domestic domain" the last report published by the American Entertainment Software Association [17] showed that 75% of heads of households play computer or video games and over 53% expected to continue playing. Besides, the use of games was viewed as positive by parents.

Apparently, from the report we can also conclude that for people under 35, video games have become a part of their lives while for people over 35 are today, at best, an occasional distraction. However, this trend is steadily changing, at least in comparison to the previous decade. A shocking example could be the game 'Brain training' [18], intended for adults to diminish the consequences of aging in the human brain. With very little publicity this game has sold in Japan over 3.9 million copies in the year 2005 and it is making its way through in other countries as well. So it seems that the barrier between people that play and people that don't is being overcome, being the arguments stated by some researchers that say that adding an instructional designer to the game development team takes the fun out of the game [6], or that there are plenty of people who do not prefer games as a way to learn, being rapidly surpassed. On the contrary, the data gathered suggests that using games to learn could prove a very interesting strategy with more and more supporters every time.

3 Learning Content Management Systems

In an era where knowledge is the main generator of wealth and where the development of intellectual capital requires of an efficient administration, it can be said that LCMS are indispensable tools for the competitiveness in modern organizations. Learning Management Systems, LMS, can be contemplated as the virtual side of traditional education, while Learning Content Management Systems, LCMS, are platforms that include contents management to customize resources to each student, usually including an engine that allows to adapt the contents to different groups of users with different profiles through XML tags and following certain established standards such as AICC and SCORM.

However an active e-learning platform must have dynamic learning strategies, real interaction and collaboration, a positive emotional climate and an easy navigation system [19], but e-learning systems are usually being developed relying too much on the traditional learning approaches and therefore suffer the same flaws such as the poor support for the individual dimension of learning, as well as the limited support for the process dimension of learning [20]. Moreover, e-learning systems still rely on relatively passive material that the learner has to absorb rather than more active experiences in which the learner is able to experiment with the new knowledge in a safe, free environment that adapts

itself to the user's characteristics and current needs supporting a personalized, active and socially aware approach. To see to what extent this statements are true we have analyzed most of the leading e-learning platforms in the market extracting the features that these LCMS proportion [21]:

- ATutor 1.5
- Blackboard 6
- Claroline 1.4
- Fle3
- ILIAS
- Moodle 1.5.2
- Sakai 2.0
- Virtual-U 2.5
- WebCT Campus Edition 6.0
- Whiteboard

The results are shown in Table 1:

Learner Tools
>>Communication Tools
Discussion Forums
File Exchange
Internal Email
Online Journal/Notes
Real-time Chat
Video Services
Whiteboard
>>Productivity Tools
Bookmarks
Orientation/Help
Searching Within Course
Calendar/Progress Review
Work Offline/Synchronize
>>Student Involvement Tools
Groupwork
Self-assessment
Student Community Building
Student Portfolios
Table 1: Main features of e-learning platforms for learning

We have also tried to analyze the cost of this platforms, but the results in this area have been very poor because it has been impossible to proportion a final cost for the commercial e-learning platform since many variables have to be taken into account such as the number of computers, number of students, maintenance, discounts by volume, etc. However, one thing is clear: commercial e-learning platforms have enormous costs, the bigger the higher number of students to manage. From our analysis we can give an

approximate cost: commercial LCMS like Blackboard or WebCT costs around 10\$ per student and year (prices for year 2006) while the cost of an open LCMS like Moodle is 0\$ per student and year since it is open source.

As we can see none of the platforms contemplates among its features a game module as a learning strategy.

So, why don't joining the growing interest of people for games with a tool that can deliver learning independently of time, physical situation and number of students?

4 Conclusions

As we have tried to point out throughout it seems to be many factors, a list of which is shown below, that indicate that game-based learning strategies included into a Learning Content Management System could prove a very interesting feature that would help the potential students to increment their skills as well as their motivation to learn:

- To profit the disappearance of physical barriers
- To profit the availability of contents twenty four hours a day seven days per week
- To reach a great amount of potential students with very few resources
- To support the new life long learning trends
- To manage the way the new "imamage" generation of students learn
- To profit the increment of time dedicated to leisure
- To profit the ability of video games to increment motivation proven by many researchers
- To profit the ability of video games to increase technological skills of people that work in technological environments

However, as for today none of the platforms studied offer this gaming module. It appears that some of them are already thinking about incorporating it to their systems. If that is finally the case we will have to face other difficulties such as what standards to follow or how do we evaluate the results of a game or even the fact that there are many aspects in the life of a person such as autodiscipline, effort, sacrifice and many other skills that cannot be easily acquired through games. We will develop these ideas in our next paper which is already in preparation.

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