

Computer Games For Learning: An Evidence Based Approach

Richard. E. Mayer

MIT Press, 2014

Review by Rob Manton

Games for Learning is a field not short of hyperbole. ‘Visionaries’ advocate the use of games rather than what is dismissively termed traditional instruction as the only way to engage and reach out to the ‘digital native’ generation. Gamification is espoused as a silver bullet to motivate a reluctant student body.

Richard Meyer brings a much needed sceptical perspective to the field and presents both an evidence based method and some of the evidence gathered to date. The method relies on the quantitative measurement of the learning that has taken place, via a post-game test relevant to the learning outcomes of interest. It also establishes methodological necessities such as an equivalently treated and randomly allocated control group, sufficient sample size and a suitable statistical measure of the relative performances of each group.

The author defines three ways to design an experiment to measure the effectiveness of a learning game. The first approach, value added, seeks to measure the impact of adding a single game element such as a particular type of feedback. The experiment is conducted with one group playing the game with the feature in question and the control group playing a version without. The second experiment design is to measure the ‘cognitive consequence’ of playing a given game compared to not playing it. For example the question might be does playing a particular action game improve spatial perception. The third category is termed media comparison and seeks to compare the effectiveness of teaching a topic using the game compared to teaching the same topic using a more traditional method.

Meyer is able to identify flaws with much of the literature in the field based on this model, for example studies that don’t include a properly randomised and equally treated control group, feature a statistically insignificant number of users, rely on anecdotes or fail to report the full statistical details.

The main body of the book is a detailed summary of the findings of a series of studies that did follow the sound method proposed. Although the findings are only tentative due to the relatively small number of reliable studies they do hint at some interesting and in some cases counter intuitive results. As an example the author presents evidence that adding a competitive element to a learning game (which is an essential feature of the gamification approach) does not necessarily improve the learning achieved, but may reduce it. Another tentative conclusion which is contrary to the received wisdom about game design is that adding on screen text to repeat what is said in a voice over actually causes a reduced amount of measurable learning. A number of other principles are established which may inform learning game designs now or be further explored in future research.

The book can be read both as a manifesto calling for better experimental methods, and as a cook book to help design sound experiments. It establishes a series of tentative principles that should provide direction and structure for future work in the area. Those principles should also help current game designers ensure that their games not only motivate and entertain their players but also achieve the learning intended.