Ten things educators might learn from the games industry

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1. Introduction

This thought piece considers what might be learned from the games publishing industry in terms of the design and production of educational activities and games. It aims to stimulate ideas for teachers, learning designers, and educational game designers in an attempt to cross the divide between game development and production and pedagogy. This paper brings together the insights of two games researchers with different backgrounds – one in university teaching and the other in the games industry – to present a considered discussion of the benefits of cross-fertilisation between these two disciplines.

This paper asserts that many of the assumptions about digital games, and games-based approaches in educational settings, made by those applying them should be subjected to scrutiny. The metrics applied to define 'success' by the Industry and Education sectors differ markedly, which presents a challenge in making the transition. Rigorous academic study of digital games, from a variety of perspectives and disciplines, is still very much in its infancy.

In much of the academic literature on games-based learning one of the key reasons given for using games to teach is their motivational qualities. The assumption that digital games are inherently motivating is challenged in reality. While games may motivate some learners, they will also be off-putting for others, particularly in the case of older learners who may have more limited time and are perhaps more strategic in their learning aspirations. It also cannot be assumed that because an individual is motivated to play games in his or her leisure time that he or she will want to play them to learn something, or that the types of game played by choice will be appropriate for formal learning. Motivation can be considered within two distinct categories: intrinsic and extrinsic. Many educational games or edutainment titles produced are reliant on extrinsic motivation factors, through extrinsic rewards for the completion of tasks or levels. While extrinsic rewards are an integral part of the rules of play (Salen & Zimmerman, 2004) fostering intrinsic motivation is key within the interactions of the game experience (Crawford, 2003) and fosters deeper learning (Cordova & Lepper 1996; Hapgood & Overmars 2006).

So while the motivational appeal of games may be present for some people, the primary reason for their use in teaching and learning must be because they have pedagogic value. Research has suggested (e.g. McFarlane et al., 2002; Sandford & Williamson, 2005) that the use of games in formal teaching situations can present problems because it can be difficult to find appropriate games for specific teaching situations and they can be time consuming to learn and complete. There are a limited number of commercial educational games available, commercial off-the-shelf (COTS) games may not map closely to the desired learning outcomes and curricula, and the cost and expertise required to create bespoke games often makes this option prohibitively difficult. Learner expectations in terms of production quality of games is another issue. While some authors argue that the game-play experience (categorised as ludology) is the be all and end all, some players – particularly those used to playing high-end console games – *do* expect a graphically high quality visual experience as embellishment to the core mechanics, and others are motivated by complex narrative (categorised as narratology).

This paper aims to overcome some of these limitations of using digital games for learning by using the games publishing industry as a starting point for examining what educational games designers, and educationalists in general, could learn from it. The paper is aimed at those with an interest in applying digital games in educational contexts – both COTS games

and those designed with explicit educational outcomes in mind, sometimes referred to as Serious Games.

The conception of computer games in education dates back to the 1950s with the integration of war-gaming and computer science research, coupled with the emergence of educational theories that emphasise active learning. The first computer games were developed in the 1960s and soon after they were being used and developed for educational purposes (Wolfe & Crookall, 1998). Educational games and simulations have been used for many years in business, training staff in financial and economic skills, and in the military for combat and strategy training, Americas Army, published in 2002, is arguably the most successful serious game produced, and the health sector has used simulation and visualisation techniques for many years, for example through the use of virtual patients.

This paper starts by presenting a case for why educators should be interested in the games publishing industry and why it has something to offer them. It then presents ten areas in which, the authors believe, education could learn from the games industry. Finally, the paper considers the wider implications of the previous discussion.

2. Learning from the games publishing industry (and why educators should listen)

Games consoles are becoming ubiquitous items within most homes in western society. Over 65% of US Households play video games, globally over 138 million Playstation 2 consoles have been sold and over 155 million console games are sold each year (Online Education, 2009). The video games market in the UK now outsells the film industry (Wallop, 2009).

Commercial games designers clearly have the ability to create highly engaging, immersive experiences where players keep coming back to for more (something that is sadly rarely the case in formal education). Good computer games are fit-for-purpose, user-focused, highly engaging, customisable and supportive. This paper considers factors that anyone interested in designing effective learning experiences can learn from the games industry and adopt in their own teaching practices. This paper will not argue that all learning should be like games, or even that all learning should be fun, but simply that there may be things that educators can learn from looking at what is common knowledge in the games industry.

This paper considers how learning designers, teachers, lecturers, and trainers might learn from game designers and publishers, who have historically been the arbitrators of defining what a 'good' game is. It is hoped that the games industry could help to shed new light of ways of achieving this for learning.

There are historically several differences between games designed for education and those purely designed for entertainment, although these boundaries are blurring with the massive upsurge in the use of social games and platforms. One major difference, however, is still the amount of money spent on design and production. Entertainment game budgets typically run into the millions, while that spent of educational games is massively less. It is unlikely to ever be the case that companies will be prepared to invest similar sums on games for learning as there is simply not the market, therefore many educational games have tended to be based on simple task-reward structures and well-tried behaviourist principles – relying on extrinsic motivation rather than learning integrated into the game design itself.

However, there is more that can be learned from the games industry than these basic techniques that may motivate some learners, while leaving others cold. This paper puts forward a range of other ways in which the educational community could learn from the game design and publishing community. This paper highlights some of the harsh realities of an industry that is sales results driven, as the metric for success historically has been the

number of unit sales. While this business model is currently being challenged by contemporary forms of digital distribution it does provide some useful pointers to achieving success.

While educators are certainly paying more attention to the games industry over the last decade than previously, there are still problems with bridging the gap. These include the academic 'not invented here' syndrome, the levels of risk typically associated with commercial games development being unacceptable in academia, and the prohibitive costs and/or expertise required to produce a game with the appropriate production values and game design quality to be acceptable by the target learner groups.

In recent years, new business models have emerged, such as digital distribution, which may advantage smaller developers. This, coupled with the recognition (belatedly) by the industry of the social impact of gaming and the potential positive contribution it has to make to society is leading to the growing acceptance of educational games as having a legitimate place in the industry as they can be shown to have commercial potential. The market for educational games is at present small but games such as the Nintendo brain training are challenging the notion that there is 'no market', which has been the default position of industry for many years.

3. Ten things educators might learn from the games industry?

This section presents a list of ten areas in which the authors feel that educational designers have something to learn from games designers and publishers. The list was created from empirical experience of over twenty years as a participant observer in the games industry coupled with extensive experience in education as teachers and researchers. This list does not purport to be complete or to be elicited from research, but simply to provide examples of the range of ways in which lecturers, teachers, trainers and others involved in designing learning can themselves learn something from another discipline.

3.1 Don't underestimate the license equity when developing games

The sales of entertainment games have historically been entirely dominated by expensive licensed IPR, either characters native to the games industry or converged with the media and film industries. Particularly with children, it is important to recognise the endorsement these characters give a game, both in terms of establishing the credibility of the game and in setting and meeting learner expectations. However, the use of existing characters or licence properties in educational games is prohibitively expensive, and may be off-putting to learners who have preconceived notions of what games involving these characters and properties involve for, example arguably sexualised characters such as Lara Croft or overtly masculine licensed properties such as Call of Duty or FIFA.

This has two implications for educators: first that there is little point in trying to emulate the big-name games because even with high-end design, the popular characters will be out of reach; and secondly, that no player will be fooled by using a copycat version of a popular character to make any aspect of education seem motivating – it will at best be amateur and derivative. It is worth considering the use of original characters that can be used to set expectations for an educational game, depending on budget, but this is by no means trivial and getting it wrong could mean that learners will not even start to engage with what is otherwise a good learning game.

3.2 Don't re-invent the wheel

This point is almost so obvious it doesn't need stated; yet the practice of creating materials and learning activities from scratch is still common in education. While it is clearly a waste of resources as regards the creation of traditional learning materials, when it comes to the design and development of computer games it becomes ridiculous. Creation of games requires specialist skills, is extremely time-consuming and expensive. It cannot really be sensible to develop every aspect of a game from scratch, particularly when easily-available middleware, modding engines or existing multi-user virtual environments (MUVEs) such as Second Life will probably do the job better at significantly less cost – both financial and in terms of team sanity.

There are also many existing games out there, either COTS or inexpensive (or free) web-based games. While these may have issues in terms of match to learning outcomes, and time taken to learn the game it is possible to overcome these by the creation of additional complementary activities outside the game, such as reflective or group activities, that allow learners to focus on the desired learning outcomes and consolidate what they have learned. Thiagarajan (2004) made the point that the game is only an excuse for the debrief and it is worth focussing on the materials that can be created – not even necessarily online – to support the game experience and enhance its educational value.

3.3   Don't think simulation – think entertainment!

A big mistake that is sometimes made with entertainment games is to try and make them over-realistic – at the expense of game play. For example racing games would become unplayable if they required the player to have the skills of a real racing driver, but are toned down to make them enjoyable and fun. While the place of fun in educational settings, particularly for older learners in further and higher education, is debatable, there is a balance to be struck between the amount of realism necessary for a game to be acceptable and for the learning from the game to transfer into real life (this will, of course, depend upon the type of game used and whether the skills are actual or abstract). There may be necessary simplifications that make a game engaging and challenging without becoming overly complex or requiring a too high a level of skill to engage in the first place.

3.4   Don't engage developers who may not share your conceptual or cultural frameworks

When designing games for learning, it is important not to forget what is trying to be achieved and in what context. Games designers work from a clearly defined conceptual brief often driven by mechanics and narrative, while education works on objectives, learning outcomes and assessment criteria. Game-based learning products must be a synthesis of these, so an understanding of the two cultures – and where they might clash – is essential. Working with a team that share the same vision, goals and cultural norms is key in game development, be it entertainment or education. While different views and opinions among team members can lead to healthy critical debate and overall a better product, problems can occur when individuals do not share an underpinning ethos.

This may be more apparent when two worlds meet, as in the case of game developers and educationalists. It is important that each takes time to listen to and respect the skills of the other in the development of educational games. The results of not doing so can be graphically stunning games that are pedagogically trivial or educationally-sound games that are so complex and boring that they are hardly games at all.

3.5   Don't conform to game development conventions or frameworks

Games for learning, particularly for younger age groups, are typically designed around a structure of levels and rewards, sticking to the principles of behaviourist approaches to game

design. In terms of game design this type of framework is tried-and-tested, relatively easy and cheap to implement and re-usable in different contexts because the learning is divorced from the game dynamic. However, it may not be the best pedagogic approach to adopt as it is difficult to support deep learning without a close integration between the goals of the game and the learning goals.

The implementation of constructivist pedagogy in games-based learning is more difficult in terms of both game and educational design but enables games to support collaboration, problem-solving, learning through experience, and reflection.

3.6   Never design games by committee and trust those 'intuitive' creatives

The design of an effective teaching experience, like the design of engaging games, contains an element of 'art' and 'craft' as well as 'science'.

Commercial games are invariably the concept of one person's intuition, the lead designer, or a small group of individuals, and there is no reason why this principle should not apply to educational games too. Designing games in large groups or with multi perspectives, objectives or desired outcomes is problematic. There should be a tight focus on the game and educational concept and a realisation that 'good enough' might just be good enough when used in practice.

Educational games tend to be used in two distinct ways: as stand alone gaming experiences and embedded in classroom practice, and the latter allows the creative teacher to adapt and use the game in a variety of ways. Trust the teacher to use the resources in professional creative ways within educational practice.

3.7   Manage developer's personal urges with an iron rod

'Feature creep' – where additional functionality keeps getting added on over-and-above the initial agreed specification – has prompted the premature burial of many a great game. The author, from personal experience, sites two examples of this: Black and White on the Playstaion console (over two and a half years in development to a point where console technology development superseded development of the game) and an Isle of Mann TT simulation in development for nearly five years (mapping and accurately simulating all 36.2 miles of the course proved time-consuming and prohibitive).

The importance of setting a goal and then not moving the goalposts cannot be overestimated in education too. Thorough planning, specification and documentation is essential to ensure that the game originally envisaged, meeting the learning outcomes intended, without getting sidetracked down routes influenced by the personal interests or perspectives of teachers or developers.

3.8   Listen to (understand) your audience (market)

This is particularly important because of some of the assumptions that surround the use of games-based learning regarding engagement and motivation. It is not the case that all learners will find something motivating simply because it is a game. A clear understanding of the target learner group is essential for educational game design, particularly in post-compulsory education, simply because if it is not seen as an appropriate way to learn, many learners will simply not engage at all.

It is crucial not to take the audience for granted or rely on 'targeted focus groups', which are groups representative of 'potential' buyers of games who are provided with Beta versions to test usability and playability. This is problematic in that this small subset of users are often comfortable with game concepts, and accustomed to the interfaces and with the genre of game, which this can inhibit objective feedback. Diverse student groups in education present a much greater challenge.

Involving learners in the game creation process itself, through participative design, is one way in which to meet higher-level learning objectives while creating a game that is tailored for its target audience. When collecting feedback from educational games it is crucial to make a distinction between people who liked the game and those who learned from it – as these can be very different.

3.9 Don't be entirely *driven by marketing and sales objectives*

Commercial games tend to be driven by the market with meeting sales objectives being a core target. For example, most game releases happen in the fourth quarter of the year – the time when there is the most potential for sales, but also the time when competition is at its highest. In terms of education, this relates to not always blindly following whatever the latest technological or pedagogic fad because it is 'cool' or assumed to be motivational (in reality, anything associated with formal education is unlikely to ever be seen as cool by its users).

Curriculum imperatives, which are often politically driven, are often also the driver for educational game development, meaning that games may quickly become obsolete as emphases change. It is better to create something that is reliable and tested in terms of pedagogy, game design and technological platform than to simply be jumping from bandwagon to bandwagon.

3.10 Don't believe that everything you do (release) will be a 'success'

In the entertainment industry, eight of out ten games will not be a success (in terms of sales) – there are games that 'burn brightly', games that are 'slow burners', but mostly games that simply 'burn out'. It is questionable whether this would be seen as an acceptable commercial failure rate for educational games. Commercial success may also not imply successful learning and it may be a difficult balancing act between creating a product that is 'fun' and commercially viable and one that meets its intended learning goals.

It is difficult to gauge failure rates in the same way in education as the 'profitability' is simply not an issue – even in Higher Education institutions the costs and incomes of individual courses or modules is often not calculated. What is certain is that an 80% failure rate would simply not be acceptable in terms of the metrics that are used in education, such as student retention or learner attainment. Perhaps educationalists need to accept and examine failure more critically, as is done in the games industry, to learn from it rather than it being seen as something that is unacceptable – if there is not a climate whether it is okay to make mistakes then innovation and creativity simply will not happen

4. Conclusions

This thought piece has aimed to draw together two distinct areas – the commercial games industry and education – to see what the latter might be able to learn from the former. Ten areas have been identified and discussed and, although these are not intended to be a complete list, the aim is that the scope of what can be learned is widened beyond techniques for supporting behaviourist learning and superficial motivation.

In the years that come, emerging forms of game play and interaction – such as pervasive or casual games – and new technologies – such as motion-sensitive and location-aware devices – are likely to have greater impact on education, particularly those that do not require high-end graphics. The increasing number of older females playing games has already started to change the market and is likely to continue to do so in coming years. This shift in 'typical' gamer and their expectations, coupled with the increasingly sophisticated and easy-to-use development tools that are becoming available, means that bespoke development may be in the means of more and more educationalists.

It is important, therefore, that the games research community focus on what elements of games really add value to the learning experience, and build on the large amounts of research (albeit typically 'non-academic') that is continually being undertaken in the games development and publishing industry. A critical awareness of the commercial sector will allow educators to take account of lessons already learned and avoid making the same (often costly) mistakes.

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