

## Engagement and motivation in games development processes

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### Summary

In 2005, Becta commissioned researchers from the University of Bolton to interview representatives of four games development companies. This report summarises the key findings from this research.

The purpose of the interviews was to find out more about how games are designed and developed, and what factors the developers themselves saw as important in generating high levels of engagement and motivation in games players.

This evidence is intended to improve understanding of the priorities, key processes and techniques that games developers use. Becta hopes that this better understanding will foster better communication between developers in the games and education sectors, and that the evidence will inform any decision makers who may be considering collaboration projects between the two sectors.

### Key findings

- Games development processes are more formalised and structured along generally accepted project management principles than the popular image of games developers implies. There are clear similarities between the processes and roles utilised by both games developers and education developers.
- Having a strong knowledge and experience of playing and examining games is an important part of creating and refining new games. The

product design of games-based learning should include developers with a good knowledge of games.

- In creating products which are engaging and motivating, games developers see factors such as celebrity licences and good marketing as just as important as good software design. The role of these 'entertainment' factors needs to be accounted for when assessing the potential value of games-based approaches for learning.
- While there are important factors in games (such as cutting-edge graphics) that involve high development costs, there are other factors which rely more on experience and skilled design than access to expensive resources. These factors include techniques for structuring goals and rewards to create positive feedback loops which can increase motivation and engagement.

## 1. Background

The use of digital games to support learning is becoming a significant area of interest for educational policy makers, advisers and e-learning developers. The levels of engagement shown by children and adults playing commercial digital games (also known as 'commercial off-the-shelf' or 'COTS' games) and the increasing body of research evidence which highlights the learning potential of games offers a way of improving engagement in learning and motivation in order to extend and challenge the ways in which learning takes place. For more about this, see the games and education research sources available from the Becta website<sup>1</sup>.

Although more games-based learning products are becoming available either as commercial offerings or through public funding partnerships, to date there has been very little direct involvement with the commercial games development studios in the education sector.

There has been ongoing dialogue at senior levels of each sector – for example between the former Secretary of State for Education, Charles Clarke, and representatives from games industry bodies such as ELSPA<sup>2</sup> and TIGA<sup>3</sup> late in 2004<sup>4</sup>. However, actual cross-over between the two sectors remains rare and is often restricted to projects driven by research funding or other public funding interventions. Only one UK-based games developer has made clear that it considers education to be a potential market: Blitz Games<sup>5</sup> has established TruSim as a new

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<sup>1</sup> <http://partners.becta.org.uk/index.php?&rid=11211>

<sup>2</sup> The Entertainment and Leisure Software Publishers Association (<http://www.elspa.com/>)

<sup>3</sup> The Independent Games Developers Association (<http://www.tiga.org/>)

<sup>4</sup>

[http://blogs.guardian.co.uk/games/archives/2005/08/17/go\\_to\\_your\\_playstation\\_and\\_do\\_your\\_home\\_work.html](http://blogs.guardian.co.uk/games/archives/2005/08/17/go_to_your_playstation_and_do_your_home_work.html)

<sup>5</sup> <http://www.blitzgames.com/>

division of the company to explore the business viability of developing games-based products for various education and training sectors.

### **Why do we need to engage with games developers?**

The structure and value chain of the commercial games industry is very different from the education sector. Games development studios rely heavily on publishing companies (such as the market leader, Electronic Arts) to fund the development, production, marketing and distribution of new games. Further detail about the structure of the sector is available from the Skillset website<sup>6</sup>.

However, the vast majority of games design knowledge, experience and creativity is held in games development studios. Publishers bring other valuable skills, resources and drive to commercial games, but they are not necessarily dedicated games design specialists.

Research to date has only scratched the surface of what games may have to offer to education, and commercial games themselves may still be in their infancy in terms of narrative maturity. However, it is games developers who are likely to offer experience and insights of most interest to education, by, for instance:

- designing engaging levels or episodes
- effectively building up the level of challenge for the player
- using interaction data to develop and adapt a game to the player's actions
- developing graphically engaging and consistent game worlds.

If the best of both games design and e-learning are to be combined successfully, then effective platforms for sharing experience and developing collaboration are needed. However, there is little direct dialogue between the education world and games developers (as opposed to publishers) to date, and little understanding of their context, their motivations and their interpretation of what makes a quality product. Given the pressures of the highly competitive environment of the games industry, there is also currently no clear business proposition that might provide a rationale for sustainable collaboration between the two sectors.

In addition, the research available about the use of games in education has predominantly focused on the end product (the boxed software). A common conclusion of researchers is that there is something engaging and beneficial in the design, gameplay and overall media quality of games software. However, little current research is available in the educational arena which looks beyond these conclusions to ask *why* such games include these potential benefits. Games have to be designed and developed, so it would make sense to examine how developers

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<sup>6</sup> <http://www.skillset.org/games/overview/>

approach this process and how they 'know' that a product will be engaging and of good quality.

## **The purpose of the Becta-commissioned interviews**

In order to improve our understanding of the context of games developers and their perspectives on designing quality products, Becta commissioned the University of Bolton to interview representatives from four games development studios.

This research primarily sought to discover:

- what processes game developers apply in order to ensure that their finished games will be engaging and motivating to players
- how game developers evaluate whether or not a game will engage and motivate players.

The interviewees all had some experience and involvement in the games industry and participants were not asked to comment on any issues relating to the education sector. This helped to elicit better responses by engaging with developers 'on their own territory'.

## **2. Key findings from the interviews**

### **How games development works**

Two main factors were determined that underpin the progress of development:

#### **i. Formal development processes and tracking**

The interviewees all reported using some form of structured project management system and said that the creation of a single design document to which all team members can refer is crucial. A strong lead developer who is in charge of guiding development is also vitally important, although the demands of the publisher will ultimately determine the quality of the product.

#### **ii. The role of intuition**

Perhaps the most 'unhelpful' issue to emerge is the role of intuition in games design. Professional game development appears to rely on the intuition of several developers: the team really is the key in the games industry today. The 'team' might mean the group of people who are actually working on a particular game, but it could equally mean a far wider subset of a game development organisation. A very high proportion of employees in games development are passionate about games and will find ways to join the debate about particular features or the look and feel of games. The influence of this 'games culture' needs to be taken into account in teams developing games-based educational content – it is difficult to see how games

design can be effectively integrated with educational unless a significant proportion of the designer team themselves are immersed in games.

### **Benefits for education**

Given the games industry's reputation as a creative and dynamic sector, people outside the sector may be surprised at the extent to which it follows formalised project management procedures. On the other hand, given that development budgets often greatly exceed £1m, following standardised procedures and getting formal sign-offs from the publisher are ways of minimising risk for developers.

The development processes and roles involved in games development have clear equivalencies with educational resource development – there is likely to be more similarity than difference in many of the roles involved.

The importance of knowing 'games lore' is critical to games developers, but is difficult to codify. This aspect suggests that unless a development company has a significant number of staff who are themselves immersed in playing and experimenting with games, the company is unlikely to create refined products which take account of the successes and mistakes of many previous games. In the education sector, the effect of not balancing educational objectives with games know-how can clearly be seen in the generally negative connotations that have become associated with 'edutainment'.

### **Engaging and motivating the player**

During the course of the interviews, it became clear that the terms 'motivation' and 'engagement' are not clearly defined in the games industry. Where the educational sector may speak in terms of motivation and engagement, the games industry tends to use terms like 'fun' or 'gameplay' or 'immersion'.

'Depth of interaction' and the complexity of some games have been highlighted as important by researchers looking at the use of games in education. It is noticeable, however, that the factors listed by the games developers interviewed here include many 'shallow' factors such as links to film or sports licences, the 'wow' factor of the graphics, and effective marketing. Certain participants also prioritised some of these 'shallow' factors above those that the educational sector may consider more important for deep interactivity.

We need to see games developers' interpretation of engagement and motivation within the context of their criteria for overall success. Ultimately, a developer's success is defined by whether the publisher is satisfied and whether the product sells well. This does not mean that developers are not interested in the depth of their products, but that 'deep' interactive design needs to be balanced with other commercial pressures.

The initial vagueness in the interpretations of engagement and motivation and the high degree of intuition that developers rely on may indicate that games developers do not commonly reflect on their design practices. While it may be true that there is not yet a consistent vocabulary for discussing these practices, all of the interviewees responded enthusiastically and comprehensively to the researchers' questions and wanted to see any resulting report.

One participant in particular had clearly thought deeply about the title of the project prior to the interview: he listed, in detail, eleven factors he related to engagement and motivation during the interview and continued to add his thoughts to a weblog<sup>7</sup> afterwards.

Section 3 below describes the main aspects that the participants interpreted as being important for engagement and motivation.

### **Benefits for education**

The feedback provided by the interviewees gives a realistic picture of the mixture of factors (both those directly related to design and other, external, factors) that result in an engaging and motivating game. There is a risk that games may be seen as engaging or innovative without taking full account of the role of licences, marketing and 'eye candy'.

Of all the factors listed by the participants, there are some which are predicated on large development budgets and high technology costs, such as for cutting-edge graphics. However, there are other factors which are more related to imaginative and skilled design than to high-cost development – for example, good use of sound effects or the skilful deployment of goal and reward combinations. These factors can be usefully examined by educational designers and may be integrated into educational resources. A discussion article about narrative design elements in games is already available on the Becta website<sup>8</sup>.

The participants' concepts of success and the terminology they use to describe their games are based around commercial indicators of success (sales, marketing and so on.). If there is to be engagement between the games and education sectors at the developer level, knowing the key concepts and priorities of the other side will help to quickly establish meaningful and positive communication.

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<sup>7</sup> <http://www.howardtomlinson.com/showpost.php?blog=1&post=4>

<sup>8</sup> <http://industry.becta.org.uk/display.cfm?resID=15502>

### **3. Factors associated with games which are engaging and motivating**

#### **'External' factors**

##### **Licences and intellectual property**

Licensing is both an external and an internal factor in the engagement and motivation of players. A licence is defined here as an intellectual property (IP) which is familiar to the player and which serves as the focus of a game. Examples of this include using real teams or players for sports games, or licensing fictional characters or scenarios from other media such as films, comic books or board games.

A licence plays a dominant role in the products of many developers, allowing them to engage the player far more quickly than if the developer were to use an unknown IP, because the player is already aware of specific aspects of the character or the world that the IP represents. The familiarity of the IP helps the player to engage with the game by reducing the time they might otherwise take to learn the game's value system. Players who are already conversant with the IP are far more likely to be aware of the types of actions expected of the character or setting. Two of the interviewees mentioned the IP or licence as being a significant contributor to the engagement and motivational aspects of their games.

##### **Motivation to purchase the game**

These are factors that lie outside of the direct effect of the game itself, but rather are motivational factors that may affect the player's selection of one game over another.

Generally speaking, the major factors that affect a player's decisions to try or buy a game relate either to the genre of the game, or to the licence or IP associated with the game. Many game developers identify the IP associated with the game as a major factor in motivating a player to pick up the game.

One developer mentioned that familiarity with the concept or setting of the game played a major part in the initial motivation to buy. One example of this would be a game which is based on a real-world sport such as football, and which includes the names and likenesses of real players. This issue is linked to marketing, as the licence gives the marketing effort a 'hook' with which to attract interested players and potential purchasers.

Finally, it is commonly accepted among developers that a large part of the initial motivation will come from the graphics and sound in the game. This aspect may also tie in with the marketing process, for the marketing department may disseminate video, screenshots, sound clips and other media relating to the game in order to generate the initial motivation. Developers therefore place significant emphasis on the quality of graphics as an early motivational factor when developing their games.



## **'Internal' factors**

### **Goals and rewards**

Goals are the objectives of specific tasks within a game. For each goal that the player achieves, they will be given a reward – these may be 'power-ups', new weapons, vehicles and playable characters or access to new areas within the game environment.

Game designers often use goals and rewards to engage their players and to motivate them to persevere with the challenges in a game. Goals and rewards can also subtly direct where the player goes next in a game by limiting progress until the player's character has gained certain items or attributes through goals and rewards.

One of the common themes from the interviews is that rewards need to be given frequently. One interviewee mentioned that initially rewards should be given for very little effort, in order to encourage players to continue to play at least until they have mastered the controls.

This structure of goals and rewards is commonly termed in games design literature a 'feedback loop' and it is evident from the interviews that this goal/reward feedback loop is a primary tool that designers use in order to encourage the engagement of players. In fact, a large part of the designer's role is to control the type, frequency and scale of the rewards.

### **Emotional depth**

Games designers use a variety of means to foster an emotional response in their players. Historically, developers have used music, sound effects and visual means in order to achieve this, and these techniques are well understood by designers.

Whereas high-quality graphics are now generally expected to be an important part of a game's attraction, the intelligent use of music and sound effects is probably less well recognised but is still an important element. For example, developers can use the location of a sound effect in the aural environment to hint at something that is happening outside the player's visual field.

Interviewees also mentioned narrative and storytelling. The quality of narrative in games is not as high as that of other media such as film or literature, but improving story and narrative in games is becoming a higher priority in the efforts to engage players.

### **Using stages with specific purposes**

An approach that has developed fairly recently is to give the player the best items in the game (such as weapons or vehicles) at the very start. The designers can subsequently take away these things, and the player will strive to regain them by



making progress in the game. In this way, the developers show the player the best that the game has to offer to encourage them to continue playing.

One developer summarised an effective game structure as follows:

- In the first few minutes of the game the player should encounter attractive graphics and music and receive plenty of positive feedback.
- In the middle stages of the game, there should be plenty of goals to achieve: the developer should be careful to ensure that the player does not get bored.
- Towards the end stages of the game, the subtleties and strategies of the game should emerge.

#### **4. Conclusion and recommendations**

We acknowledge that this report is based on a very limited interview sample. However, the views gathered through the interviews at least provide a starting point for further dialogue with games developers and the education sector.

The interviews provide a snapshot of approaches and attitudes to development, as well as some insight into where there may be common ground between games and educational product development, and where there are clear differences. The following key points became apparent from the interviews.

- Key project and design concepts involved in games development appear to be broadly similar to those employed in most educational content design approaches – for example, the use of a structured project management process, design documentation and the role of user testing.
- However, the understanding of terms such as engagement and motivation are very different from what may be commonly accepted in the educational content sector. The games developers interviewed were not familiar with these terms, and further discussion led to definitions that were rooted in factors such as graphical and audio quality, commercial success and celebrity licences.
- Games designers are immersed in games and gameplay, and base their design approaches on an understanding of a games 'lore' which develops from an awareness of a wide range of other games which they will have played or may have been involved in producing in the past. This provides a strong library of 'tried and tested' approaches and existing design approaches which may be developed further.
- The interviews revealed that, in their approaches to games design, the developers rely largely on intuition and experience, which is not codified. Whereas project and process concepts and terminology were clearly defined, the design-focused discussions in the interviews demonstrated

the lack of opportunity to reflect on and define more 'esoteric' concepts. However, when prompted by the interviewers, all of the interviewees were clearly interested in exploring these questions and issues.

If we are to see more dialogue and collaboration between the education and games sectors, the environment, business models, core concepts and motivations of games developers need to be better understood.

If dialogue and communication is to be clear, we need to know where there are similarities and differences in terminology, definitions and design approaches, otherwise communication will be confused and awareness of the opportunities will be limited.

Sustainable collaboration needs to be grounded in common agreement from both sides about key principles – for example about suitable business and development models that balance the experience and needs of both the games and the education sectors.

Based on the outcomes of the interviews and the background of existing research and projects into the potential of games-based approaches for education, we offer the following recommendations for further investigation:

- Further work is needed to clarify the similarities and differences in terminology, concepts and key drivers to development in the games and education sectors in order to ensure that further dialogue is clear and fully engages both sectors.
- The design and development processes used in the games industry could be examined in more detail to identify commonality between approaches used in the games and education sectors, and also other issues that affect both sectors. This may lead to more mutually beneficial collaboration and discussion where it is clear what expertise each side can bring – for example, methods of increasing 'immersion' from the games sector, and accessibility and technical standards expertise from the education sector<sup>9</sup>.
- There needs to be a better understanding of the structure, value chains and routes to market of the games sector (and specifically those of games development companies) in order to develop a clear picture of what differences in terms of priorities, time scales and external pressures need to be addressed in discussions about potential collaboration.
- The reality of what is seen as 'engaging and motivating' in the games industry needs to be acknowledged and understood as having elements that may not be replicable in or a priority for education (for example

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<sup>9</sup> The International Games Developers Association (IGDA) has established an accessibility special interest group to raise the profile of accessibility issues in the industry [<http://www.igda.org/accessibility/>].

cutting-edge graphics and audio or celebrity licences). Further studies of the potential of games-based approaches could examine and delineate those factors that are desirable and reasonably achievable for educationally focused products to include and those that – given the resources and infrastructure of the education sector – are not a priority or would clearly be unachievable.

If you would like to find out more about research and projects looking at the potential of games for education, you can find further information in the computer games and education area of the Becta website<sup>10</sup>. Becta also supports an email discussion group<sup>11</sup> which focuses on sharing games and education ideas, issues and news.

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<sup>10</sup> <http://partners.becta.org.uk/index.php?&rid=11211>

<sup>11</sup> <http://lists.becta.org.uk/mailman/listinfo/gamesandeducation>