



Interface Design for Effective e-Learning: What Lessons can be Learnt from Game Design?

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Abstract

A look at examples of how game titles for the GameBoy Advance handheld make effective use of the small display area in getting information across to the user. The limited controls are also taken into account. With this information I hope to then create an effective environment in other software that I create, especially in regard to the *e-Learning with the GameBoy Advance* project that I am currently working on. I hope others, and not just games developers, may benefit from this analysis.

Led By Example

Below are screenshots taken from seven typical, but very different, games covering many of the gaming genres. In looking at these I am trying to identify common practice in terms of displaying information to the games player.



Advance Wars 2: Black Hole Rising *Fighting screen*

- Each player has half a screen with your character's cut off avatar in the corner.
- A health bar represents the hit points left for your vehicles, along with a large number.
- A small label shows defence power with stars.
- The fighting vehicles sit on a background which matches that of your position on the world map.

Advance Wars 2: Black Hole Rising *Game board/ world map screen*

- Each of your characters are colour coded and has a number displaying their health on them.



James Bond 007: Nightfire *First person view screen*

- Health is shown as a segmented disc in the bottom left corner.
- Your weapon is in your character's hand
- Ammo is a white text label, despite the character having a white cuff beneath it.
- Your current selected item is in the bottom right corner.



Mario and Luigi: Superstar Saga

Battle screen

- Menu items are shown as pseudo 3D boxes above the current character's head.
- Speech bubbles display instruction and conversation text from a character.
- The area you are in is written in the top right.



Monster Truck Madness

Racing screen

- Labels are shown as orange italic text.
- Variables, such as speed, are larger white text.
- Car name is in the bottom left.
- A power bar is at the bottom of the screen.

Shining Soul

Save select screen

- Four files are available with numerous stats displayed for each.
- Abbreviations, along with icons, used to distinguish stats, e.g. ATK with a sword for attack, DEF with a shield for defence.
- Instructions are at the bottom.
- Small labels at the top of the screen show what the controls do.



Shining Soul

Creating a new file screen

- Each character class has an avatar and title.

Shining Soul

Entering your name screen

- Control a hand pointer to select text from an on screen keyboard.





Shining Soul

In game menu

- Icons display the menu items with a text bar below to show what each means.

Shining Soul

Game message display

- Game messages to the player are displayed in a text bar at the bottom of the screen.
- An arrow at the bottom of the bar shows there is more to read.



Shining Soul

Character conversation display

- Conversations are displayed in a text bar at the bottom of the screen with a portrait of the character currently speaking above it.

Shining Soul

In-game screen

- The player has their health displayed using text and a graphical bar in the top left of the screen at all times.



Sonic Advance 3

In-game screen

- Lives are shown next to an icon in the bottom left.
- The character you are controlling is represented by an icon in the top left.
- Rings collected are shown as text next to this.
- Time left has a small yellow label and large white digits at the top.



Splinter Cell

In-game screen

- Your weapon is shown as an icon in the top left, next to your amount of ammo.
- Your health bar is in the top right.
- Both of these are green, as if displayed on your character's PDA screen.



Lessons To Learn

- Sensibly, any data displayed in-game is pushed to the edges of the screen. The top corners are most often filled, but there is regularly data at the bottom of the screen too.
- Non-essential data, such as detailed character status or objectives, is usually put into a separate screen or menu.
- Menus usually appear after pressing the Start button, either filling the screen or showing up as icons near the player's avatar. This negates the need for a Pause button since the menus stop the in-game action anyway.
- Icon based displays are often accompanied by a dynamic text area which changes to show what the highlighted item represents.
- Text labels, or other static information, is usually shown in a smaller font in a different colour to the data that changes, such as health, or speed. This is usually in a larger font, coloured white with a black border.
- Contextualising information can help, for example Splinter Cell's PDA screens or Mario & Luigi's speech bubbles.
- Where possible, a 'safe viewing area' is implemented where a border of a few pixels at the edge of the screen never has any text or icons within it so that everything can be read from any viewing angle.

Comparing My e-Learning Software To These Conventions

Below are screenshots taken from just some of the various points in the e-Learning software I have created. This is to show how the lessons fit with these conventions, and to act as a style guide when developing further content.



Food Chain

Title screen

- Safe display area (border around screen.)
- Common font used for title (the same as that for labels.)



Food Chain

Text description screen

- Safe display area (border around screen.)
- Common font.
- Colour coded text to help contextualise the information.



Food Chain

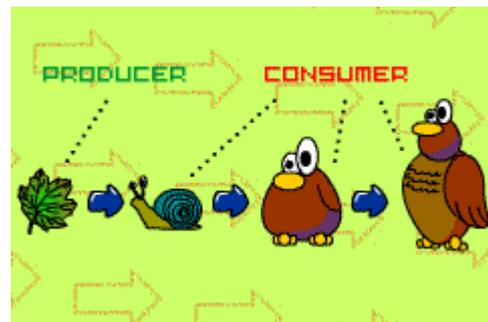
Example screen

- Safe text display area (border around screen.)
- Common font.
- Low colour count.

Food Chain

Text description screen

- Safe text display area (border around screen.)
- Common font.
- Colour coded text to help contextualise the information.



Food Chain Game: Eat The Worms

Game screen

- Safe display area (border around screen.)
- Common font and colour for labels.
- Variables are a larger font and in white.
- Action commands are in a third font and colour.
- Consistent character design.

Food Chain Game: Eat The Worms

Game screen

- Few colours used.
- Characters are 'above' game data labels.





Bibliography

Applying Video Game Interaction Design to Business Performance - Round 2

Shirinian, Ara and Dickelman, Erik NOV/DEC 2002, Performance Improvement, Volume 41 Number 10

Designing and Evaluating the User Interface: Make your Design User Seductive

Charm, Orrin March 1996, Home Automation & Building Control

Físchlár on a PDA: Handheld User Interface Design to a Video Indexing, Browsing and Playback System

Lee, Hyowon, Smeaton, Alan F., Murphy, Noel, O'Connor, Noel and Marlow, Seán, Dublin University

User Interface Design for Games

Kieras, David, University of Michigan

Effective Affective User Interface Design in Games

Johnson, Daniel and Wiles, Janet

<http://www.nintendo.com>

Screenshots from:

<http://www.eurogamer.net>

<http://www.gamerslogik.com>

<http://www.gamespimp.com>

<http://www.gbacentral.net>

There are also many more relevant web links on my project website at:

<http://www.createuk.co.uk/gba/bookmarks.htm>

