TRAINER PREPARATION GUIDE 1.5: UNDERSTAND COMPONENTS

Lesson Objective 1.5:

Understand components. Topics: differentiate between tool creation and game programming, understand artificial intelligence (AI).

Required materials to teach this lesson:

1. 98-374-ENU-1.5-LP
2. 98-374-ENU-1.5-IC
3. 98-374-ENU-1.5-IC_Key
4. 98-374-ENU-1.5-PC

Preparation tasks

Technical preparation activities:

1. **Vocabulary:**

   artificial intelligence (AI): The subfield of computer science concerned with the concepts and methods of symbolic inference by computers and symbolic knowledge representation for use in making inferences. AI can be seen as an attempt to model aspects of human thought on computers.

2. **Additional readings and resources:**

   Other resources (books, e-reference):

   Video Games and Artificial Intelligence: *http://research.microsoft.com/en-us/projects/ijcaiigames*

   Millington, Ian, and John Funge. Artificial Intelligence for Games (Burlington: Morgan Kauffman, 2009)

   Rogers, Scott. Level Up: The Guide to Great Video Game Design (West Sussex, UK: John Wiley & Sons, 2010)

   Schell, Jesse. The Art of Game Design: A Book of Lenses (Burlington: Morgan Kauffman, 2008)

Instructor computer setup:

1. None

InstructIonal preparation activities:

1. Students should have experience using game development tools, such as a level editor or audio utility like XACT that is bundled with XNA®.
2. Students should have programmed games, especially games with basic AI, such as enemies that respond to player movement.

3. Review the instructor notes in the notes panes of the Microsoft PowerPoint® presentation slide deck.
4. Make student documents available as needed.

Lesson sequence (50 minutes)

Activating prior knowledge/lesson staging (5 minutes):

How do game creation tools, such as level editors and map creators, contribute to creating a game? They are specialized programs that will create game components, such as maps and levels. They allow the programmer to vary these components quickly without having to hard-code them. Now the programmer can focus on the algorithms specific to the game application.

Guiding questions:

1. **What is the difference between tool creation and game programming?** A tool is a specialized application used to make an aspect of a game like a map or level. A tool is programmed mainly for content creation and used in conjunction with existing programming tools and environments. A tool differs from game programming in that game programming results in a game, but a tool results in an application that creates parts of games.
2. **What is AI?** The subfield of computer science concerned with the concepts and methods of symbolic inference by computers and symbolic knowledge representation for use in making inferences. AI can be seen as an attempt to model aspects of human thought on computers. It is often used in algorithms that control character behavior.

Lesson activity (40 minutes):

1. Teacher instruction (15 minutes)
    a. Use the included PowerPoint presentation to review game components.
    b. Refer to examples of AI throughout the lesson and elicit examples from the students. Have students describe the algorithms that create the AI using natural language or code depending on their background experience. Use a flowchart to diagram an AI algorithm.
    c. Instructions for the in-class activity are found in the presentation. Students should use the in-class activity document provided.
2. In-class activity (20 minutes)
    a. Students are to complete 98-374-ENU-1.5-IC.
3. Post-class Activity (5 minutes)
    a. Provide instruction for the post-class activity as needed. Establish a completion date.

Lesson review (5 minutes):

1. Discuss the guiding questions.
2. Discuss the results of the in-class activity.
3. Instruct students to write and submit any questions they have or any topics about which they would like more assistance. After class, look through the student responses and follow up with any student requiring additional help.