



# R641: Instructional Development and Production Process II: Focus on Learning Games, Simulations and Role Plays

Spring 2007

**Prerequisite:** [R541](#) or equivalent

**Class hours:** Tuesday and Thursday: 11:15 a.m. - 12:30 p.m. in [ED 2015](#)

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## Goals and Objectives for R641

This course will emphasize design, development and evaluation of *learning* games, simulations and role plays.

We will:

- Play learning games, simulations and role plays
- Discuss design characteristics for effective games, simulations and role plays
- Determine valid ways of measuring learning from games, simulations and role plays
- Design a new learning game, simulation or role play that teaches a set of abstract concepts and processes (team project)
- Create a rapid prototype (team project)
- Conduct formative evaluation with the target audience, and measure learning achievement (team project)
- Revise prototype based on formative evaluation (team project)
- Conduct a second formative evaluation with the target audience, and measure learning achievement (team project)

An example of a simulation game developed previously in this course: [The Diffusion Simulation Game](#) (anyone can play this at <http://www.indiana.edu/~istdemo/guest.html>). **IU students should use the following link, which is the full version:** <http://www.indiana.edu/~istdemo/dsgnew/login.phtml>.

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## More Details

Games, simulations and role plays *can* be effective strategies for learning. They can be highly engaging, motivating, and just plain fun for students to participate in. Unfortunately, many games and simulations today are entertaining, but their value is questionable for helping achieve learning objectives that educators have in mind for students. How do you design games, simulations and role plays that are effective, that result in desired learning achievement?

This is *not* a course on designing computer video games and simulations per se. The focus instead is on designing games that promote adult learning. We will not only design games/simulations, but also evaluate them. We will conduct formative evaluations of the designed games/simulations with actual learners. We will assess learner skills and knowledge both before they play and afterwards. We

will also observe what adult learners do while playing the games and simulations. The criterion for success is not only that the games are engaging and motivating, but most importantly that students learn. And we will measure that learning.

What forms will the games/simulations take? This will depend on students in the R641 class. For those students with sufficient skills in computer programming and animation, the game or simulation could be electronic in format, but that is not a requirement. Games and simulations can also be in other media that include printed materials and physical objects (e.g., board games). Teams will be formed in R641 with 3-4 students per team. The game format will be adjusted to the abilities of the team members. This is not a course on computer programming or animation -- that is beyond the scope of this course. The emphasis is on design of games/simulations and evaluation of learning. Prototypes of games/simulations designed in R641 could eventually be realized digitally, but the prototypes themselves need not be embedded in computers.

To help stimulate design ideas, we will use and/or adapt templates (or frames) that have been developed by Thiagi. To measure learning achievement, we will incorporate Mager's strategies for measuring instructional results. Formative evaluation and usability testing are also central to this course, and for this we will use strategies from Frick and Boling. For evaluating the learning properties themselves in games and simulations, we will apply Merrill's criteria derived from first principles of instruction. See below resources.

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## Texts and Other Resources (tentative)

### Textbooks

Authors: Theodore Frick and Elizabeth Boling

Title: [\*Effective Web Instruction: Handbook for an Inquiry-Based Process\*](#)

Publisher: (Web version free to IU students)

Date: 2002-2004

Author: Robert Mager

Title: *Measuring Instructional Results*

Publisher: Center for Effective Performance (3rd edition)

Date: 1997

Author: Sivasailam Thiagarajan

Title: *Design Your Own Games and Activities: Thiagi's Templates for Performance Improvement*

Publisher: Pfeiffer

Date: 2003

Author: Sivasailam Thiagarajan

Title: *Simulation Games by Thiagi*

Publisher: Workshops by Thiagi

Date: 2004

### Other Resources

- Merrill, D. (2002). [First Principles of Instruction](#) (PDF) (requires IU network ID and password)
- Merrill, D. (2001). [Five Star Rating Scale](#) (PDF) (requires IU network ID and password)

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## Evaluation and Grading

You will work on teams of 3-4 students. Each team will design, develop and evaluate a game, simulation or role play activity which teaches a set of abstract concepts and processes.

Your grade will be based on individual contributions (35 percent) and team deliverables (65 percent).

- Lead the class in playing an educational simulation/game from one of Thiagi's books and debrief afterwards: 5 pts. individual

- Design and develop rapid prototype of educational simulation/game: 15 pts. team
- Conduct formative evaluation of prototype and write report on results: 15 pts. team
- Do self- and peer-evaluations #1 of your contributions to team project: 15 pts. individual
- Design and develop final version of educational simulation/game: 15 pts. team
- Conduct formative evaluation of final version and write report on results: 15 pts. team
- "Present" game to class (and we play it): 5 pts. team
- Do self- and peer-evaluations #2 of your contributions to team project: 15 pts. individual

The simulation/games you develop will teach concepts and processes of intentional systems (e.g., education systems, school systems, business systems, government systems, military systems). Your instructor will provide resources for learning about these systems properties yourselves as you design and develop simulation/games to help people learn these properties.

After the first 6 weeks, most class sessions will be devoted to work on team projects with coaching and feedback from your instructor. In other words, you can use class time for team meetings and design/development work that needs to occur by working together.

## Letter Grade Equivalents

- A+ = 100 - 100+
- A = 95 - 99
- A- = 90 - 94
- B+ = 85 - 89
- B = 80 - 84
- B- = 75 - 79
- C+ = 70 - 74
- C = 65 - 69
- C- = 60 - 64

## Tentative Schedule

Week	Day	Activity
	Tues. Jan. 9	Intro to course. Play the <a href="#">Diffusion Simulation Game</a> online (begin in class, continue on own time and repeat at least 4 times before Jan. 16, record scores)
1	Thurs. Jan. 11	<p><b>Premise: Well-designed educational simulations and games can increase successful student engagement in the right activities. Successful student engagement in the right activities promotes learning achievement.</b></p> <p>Research on learner engagement. Successful student engagement in the right activities matters.</p> <p>Representative readings in Academic Learning Time:</p> <p><a href="http://chiron.valdosta.edu/whuitt/col/process/ALT.html">http://chiron.valdosta.edu/whuitt/col/process/ALT.html</a> (academic learning time)</p> <p><a href="http://chiron.valdosta.edu/whuitt/col/process/class.html">http://chiron.valdosta.edu/whuitt/col/process/class.html</a> (classroom process variables)</p> <p>What matters to student success at the postsecondary level (Kuh)</p> <p><a href="http://nces.ed.gov/npec/pdf/Kuh_Team_ExecSumm.pdf">http://nces.ed.gov/npec/pdf/Kuh_Team_ExecSumm.pdf</a> (executive summary)</p> <p><a href="http://nces.ed.gov/npec/pdf/Kuh_Team_Report.pdf">http://nces.ed.gov/npec/pdf/Kuh_Team_Report.pdf</a> (full report, read pp. 7-9)</p> <p>First principles of instruction (Merrill): Read</p> <p><a href="http://www.indiana.edu/~istr690/frick/articles/merrill_firstprinciples.pdf">http://www.indiana.edu/~istr690/frick/articles/merrill_firstprinciples.pdf</a> (requires IU network ID)</p> <p>Thiagi (2003). Introduction: Toward Serious Playfulness. In R641 course text,</p>

		<i>Design Your Own Games and Activities: Thiagi's Templates for Performance Improvement</i> , pp. 1 - 10.
2	Tues. Jan. 16	Complete the online survey: <a href="http://www.indiana.edu/~edsurvey/evaluate/">http://www.indiana.edu/~edsurvey/evaluate/</a>  Discussion of student self-reports on academic learning time, academic achievement, Merrill's first principles of instruction, and typical course evaluation items. See the <a href="#">key</a> .  Read Mager (1997), <i>Measuring Instructional Results</i> (R641 text)
	Thurs. Jan. 18	<b>The activities in the simulation/game need to match the learning objectives. Measurement of learning achievement needs to match the learning objectives.</b>  Debrief. Discuss learning objectives of the DSG and how we could measure learner achievement.  Measurement of learning – discuss how to evaluate learning objectives of <i>educational simulation/games</i> .  Read Mager (1997), <i>Measuring Instructional Results</i> (R641 text)  Plan schedule for game playing.
3	Tues. Jan. 23	Read Maccia's epistemology (pp. 111-117) in Frick, T. (1997). <a href="#">Artificially intelligent tutoring systems: what computers can and can't know</a> . <i>Journal of Educational Computing Research</i> , 16(2), 107-124.  Discuss measurement of: knowing that one, knowing that, and knowing how.  Plan schedule for game playing.
	Thurs. Jan. 25	Play educational simulation/games from Thiagi's books – led by students in class; debrief; discuss measurement of learning objectives for that simulation/game
4	Tues. Jan. 30	Guest: Sivasailam Thiagarajan a.k.a. Thiagi
	Thurs. Feb. 1	Continued: Play educational simulation/games from Thiagi's books – led by students in class; debrief; discuss measurement of learning objectives for that simulation/game
5	Tues. Feb. 6	Continued: Play educational simulation/games from Thiagi's books – led by students in class; debrief; discuss measurement of learning objectives for that simulation/game
	Thurs. Feb. 8	Continued: Play educational simulation/games from Thiagi's books – led by students in class; debrief; discuss measurement of learning objectives for that simulation/game
6	Tues. Feb. 13	Continued: Play educational simulation/games from Thiagi's books – led by students in class; debrief; discuss measurement of learning objectives for that simulation/game  Begin discussion of learning objectives for games to be developed by student teams in R641.
	Thurs. Feb. 15	Form teams. Begin team planning for simulation/game(s) to be developed to achieve learning objectives. Guest appearance by Thiagi?
7	Tues. Feb. 20	Rapid prototyping of simulation/games by teams
	Thurs. Feb.	Rapid prototyping of simulation/games by teams

	22	
8	Tues. Feb. 27	Rapid prototyping of simulation/games by teams
	Thurs. Mar. 1	Formative evaluation of simulation/game prototypes, including usability evaluation (play testing) and measurement of learning achievement
9	Tues. Mar. 6	Formative evaluation of simulation/game prototypes, continued
	Thurs. Mar. 8	Formative evaluation of simulation/game prototypes, continued
10	Tues. Mar. 13	No class – Spring Break
	Thurs. Mar. 15	No class – Spring Break
11	Tues. Mar. 20	Develop simulation/games based on what you learned from formative evaluation of prototypes
	Thurs. Mar. 22	Develop simulation/games based on what you learned from formative evaluation of prototypes
12	Tues. Mar. 27	Develop simulation/games based on what you learned from formative evaluation of prototypes
	Thurs. Mar. 29	Develop simulation/games based on what you learned from formative evaluation of prototypes
13	Tues. Apr. 3	Develop simulation/games based on what you learned from formative evaluation of prototypes
	Thurs. Apr. 5	Develop simulation/games based on what you learned from formative evaluation of prototypes
14	Tues. Apr. 10	No class – AERA Conference in Chicago Formative evaluations of simulation/games developed
	Thurs. Apr. 12	No class – AERA Conference in Chicago Formative evaluations of simulation/games developed
15	Tues. Apr. 17	Revisions of simulation/games based on formative evaluations
	Thurs. Apr. 19	Revisions of simulation/games based on formative evaluations
16	Tues. Apr. 24	Team project demos in class: Play final versions of simulation/games developed
	Thurs. Apr. 26	Team project demos in class: Play final versions of simulation/games developed
17	Tues. May 1	Finals week: Final reports Due
	Thurs. May 3	Finals week: Self- and Peer-Evaluations Due

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