INSTRUCTIONAL GAMES: A FRAMEWORK

Purnima Valiathan
Head Instructional Design Team
Knowledge Platform

Puja Anand
Chief Content Officer
Knowledge Platform

Table of Contents

Abstract

In the last few years, there has been a lot of excitement about games in E-Learning. While everyone understands the concept of games (didn't we all grow up playing games?), we see different interpretations of the word games when used in the context of E-Learning. The attempt in this paper is to demystify the concept of *instructional games* and provide a framework and taxonomy that will help designers design games for E-Learning courseware.

Introduction

In the last few years, there has been a lot of excitement about games in E-Learning. While everyone understands the concept of games (didn't all of us grow up playing games?), we see different interpretations of the word games when used in the context of E-Learning. The attempt in this paper is to demystify the concept of *instructional games* and provide a framework and taxonomy that will help designers design games for E-Learning courseware. We also hope that this framework and taxonomy will help our clients select the type of game that works best for their needs.

Instructional Game: A Definition

Games, when used appropriately, provide an excellent learning aid. Games can help clarify abstract and difficult concepts, provide a fun way to practice what is learned, and provide the variability that is so necessary for holding attention. In short, games serve a two-fold purpose in the learning process.

- o **Learning and Understanding**: Using games to teach helps learners practice essential formulas, facts and processes. Games can be used as a strategy to apply what the learners have learned. Games can also be used to address topics that learners have difficulty grasping.

- o **Motivation**: Lack of interest in a topic or subject leads to a lack of motivation. Using games to teach such topics can make the topics more interesting, and adds a fun element to the learning process.

In this paper, we use the term *instructional game* to imply an activity that is embedded in any learning material for the purpose of enhancing the teaching-learning process and motivating the learner to go through the learning material.

Structure of an Instructional Game

Think about any game you have enjoyed playing. It must have had some ultimate goal, some way to keep score, some rules to constrain the game, some type of difficulty or challenge and some strategy element to increase your chances of winning.

Just like games have certain attributes, we can also identify specific attributes of instructional games. These are as follows.
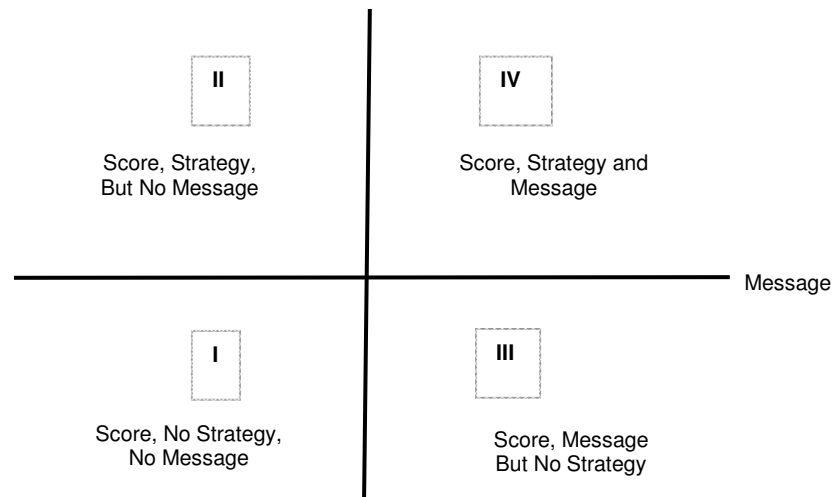
- o **Score**: This is the element of winning or losing. It is the core of any game, including the instructional game.

- o **Strategy**: This element has a direct bearing on the score. If built into an instructional game, it allows the learner to manipulate the game so as to maximize his/her score. This element can be designed in the form of bonus points, rewards etc.

- o **Message**: This element has a direct bearing on the learning objective of the learning material. In other words, if the game is designed to communicate a concept to the learner, we can say that it has a message component.
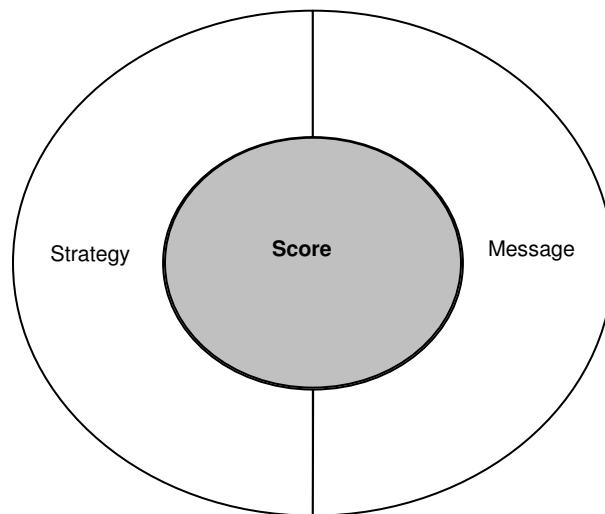
Instructional Game: Structure

The Framework

Using the above structure as the base for instructional games, we can identify four types of games that are included in E-Learning. These types can be identified in the figure below.

| II	IV
Score, Strategy, But No Message	Score, Strategy and Message

Message

I	III
Score, No Strategy, No Message	Score, Message But No Strategy

Instructional Games: A Framework

In this figure, each quadrant represents a game type. The game type is based on the combination of the two components of instructional games, viz., strategy and message. Note that, within this framework, the score component is common to all game types. Let us look at each quadrant in detail.

Quadrant I: **Score Only, No Strategy, No Message**

A game type that falls in this quadrant captures score, but does not contain either a strategy or any instructional message. The game only has the score component, and the purpose of including it is to merely provide a *jazz* value to the E-Learning material.

Example:

In the sample below, we are using a basketball metaphor to provide options for selection. Upon clicking an option (a labeled basketball), the basketball either goes through the basket (if correct) or drops back. There is no relevance of the basketball game to the subject being tested.
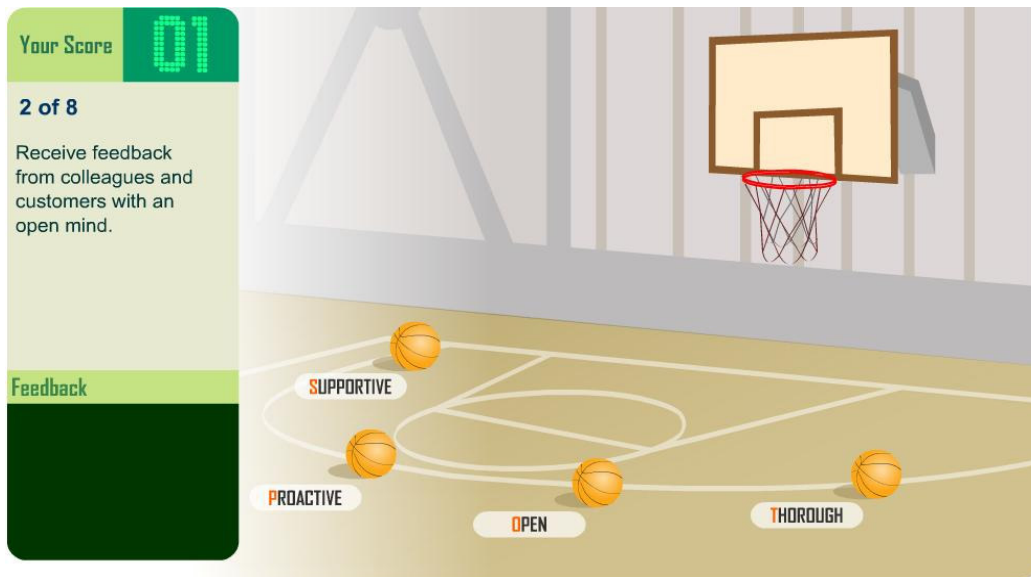
Although one would think that Quadrant I games will not find many applications, several of our clients like such games to be included in their courses.

In the same quadrant, we identify another type of game, which doesn't have a strategy or message, but has a **strong context**. For example, in a course on Information Security, we designed a course about protecting a gem from a thief. The game design did not have a strong focus on the message of information security, but in a subtle manner, the presence of a strong context reiterated that information assets are precious and must be protected.

Another example of this type of game is one based around catching a couple of money laundering criminals as they escape to various parts of the world. This game is used in an Anti-Money Laundering course. The context is very strong and relevant (that money launders are criminals), but there is no strategy and no message derived from playing the game.
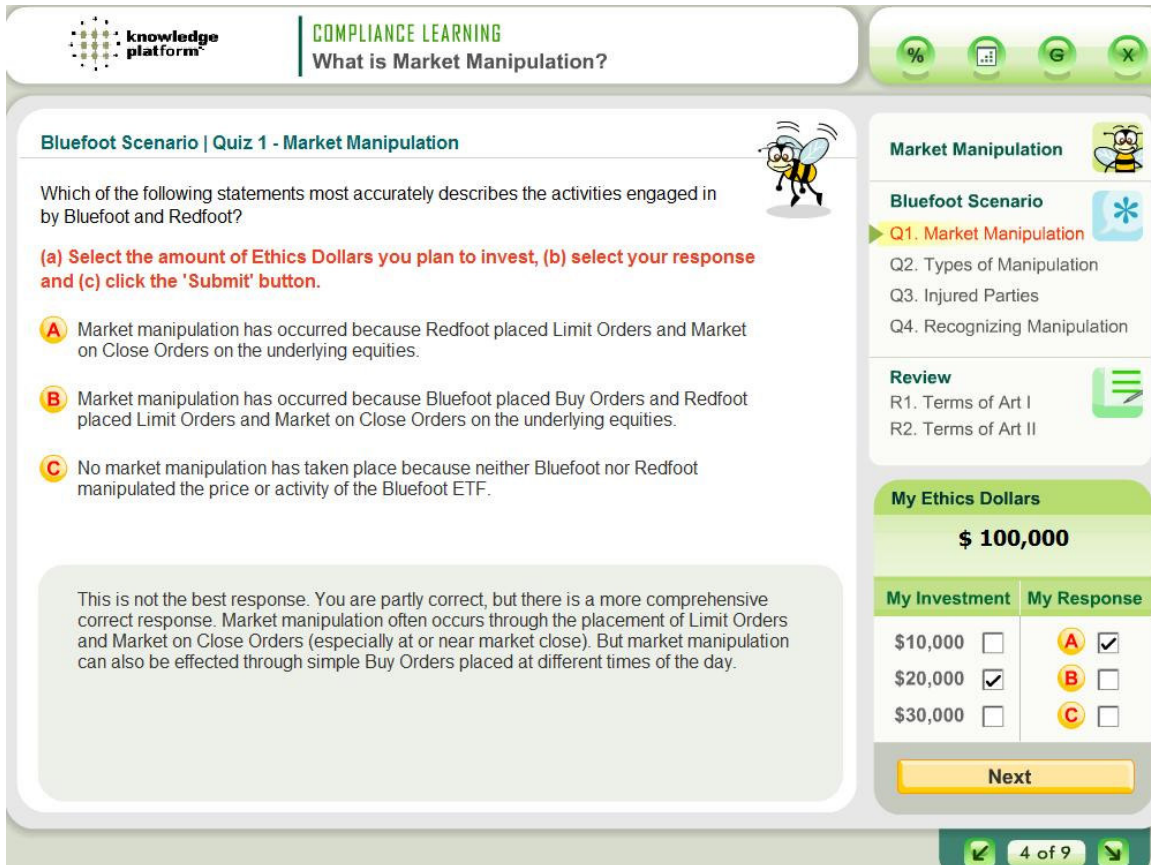
Quadrant II: Strategy, No Message

A game type that falls in this quadrant has an additional element of strategy to increase motivation. The game by itself does not actually teach or communicate a message, but is included as a *wrapper* to motivate the learner to go through the content or quiz, that may otherwise be perceived as boring and dull. The strategy element allows learners to control the game based on some skill or technique that makes the exercise exciting and interesting.

Example:

In a course for investment bankers, we wrapped the traditional quiz in a format that allowed learners to place a bet before answering a question. They could view the question and choose to select a bet before answering it. This way, even without knowing all answers, they could strategize and gain a high score.

In another game used in an anti-money laundering course for casinos, learners spun the roulette wheel and selected a chip before viewing a question. Another example is a game in which learners can seek help from an expert 3 times, but the score they gain is lower than if they answered without help. Learners can choose to seek help strategically.

In all these cases, the element of strategy added to the "fun" element in the game, and encouraged learners to play it several times to improve their scores.

Quadrant III: **Score and Message, No Strategy**

A game type that fits into this quadrant has the message component, but no strategy. It is designed to help learners *meet a learning objective* - to demystify and simplify abstract concepts, and thereby make these easier to learn and understand.

Example:

To explain the concept of stages of money laundering and how it becomes more and more difficult to detect it as the money moves through the stages, we designed a game which had dirty money being washed in a washing machine. The objective was to detect and catch the dirty money as it spun in the washing machine. The game was so designed that in each progressive stage, it became harder and harder to detect dirty money and catch it. This drove home the message that it is very important to detect money laundering at stage 1, when the criminals first deposit money in a bank.
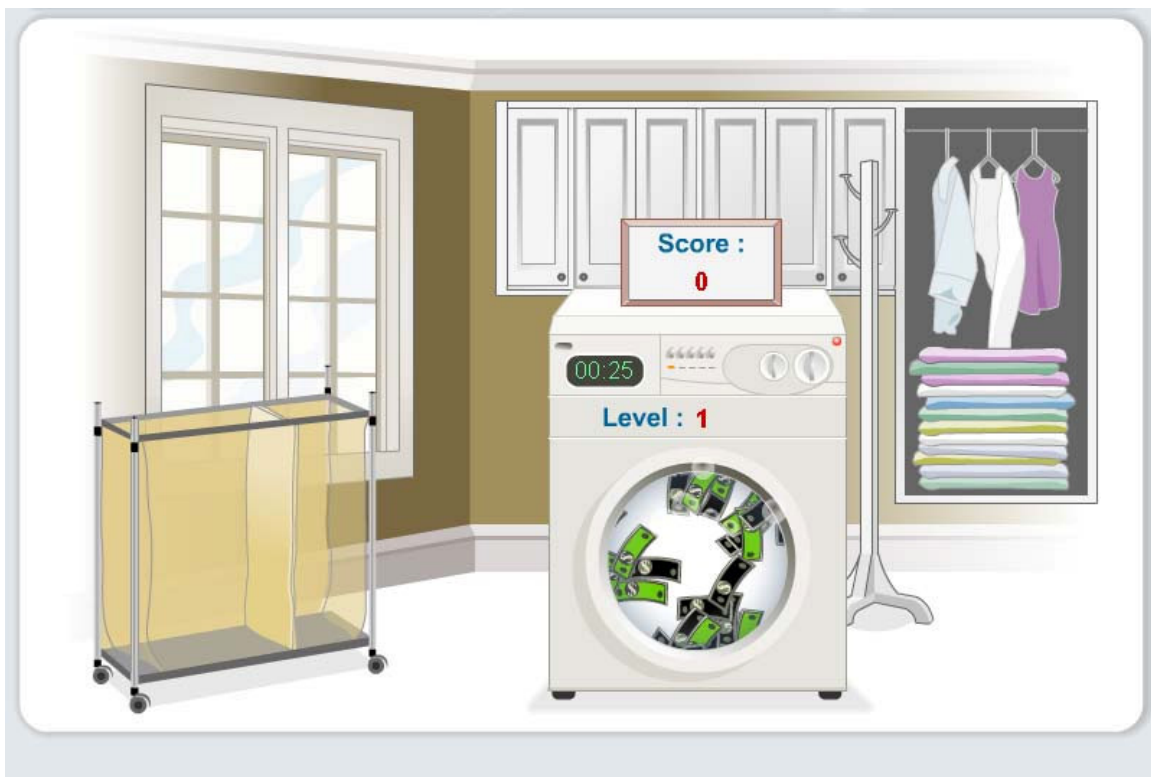
In another course that tackled the concept of objective setting for performance improvement, we designed a game in which learners were supposed to do something without being given any clarity and scoring instructions. What they chose to do (catch all golden apples) was based on their background and past experiences. In the next stage, clear instructions and scoring mechanisms were described. This drove home the message that unless objectives are set clearly and at the start of a year, staff will not be able to perform to their best abilities.

Quadrant 4: Score, Strategy and Message

A game type that falls within this quadrant has within the game itself, the two instructional components – strategy and message, apart from the core component, the score. This is the highest form of game design in this framework as it provides *motivation, an opportunity to strategize while at the same time, learn something.*

Example:

In a course on quality, we designed a game to explain the definition of quality, which is meeting customer requirements. We also wanted to focus on the message that if a customer's requirements are not met, you are likely to lose him.

For this purpose, we designed a game in which learners took on the role of a florist, where they had to take orders from several clients and meet their requirements within a specific time. The element of strategy came from how one chose to remember the orders and what sequence of actions to use, since there were many possible ways in which to be successful.
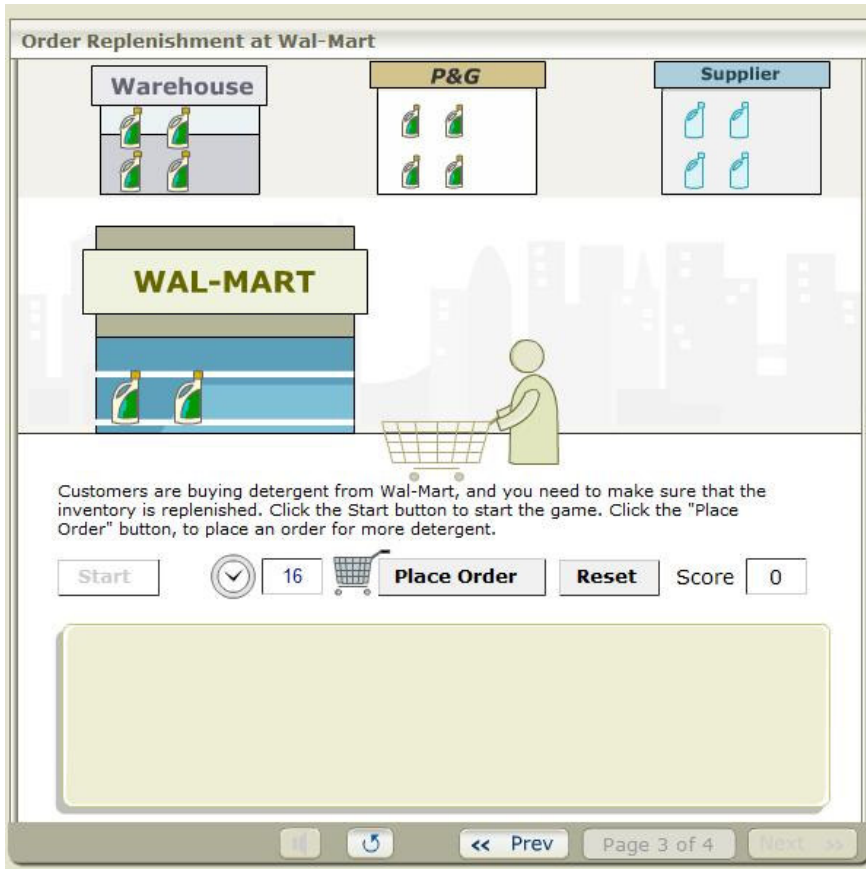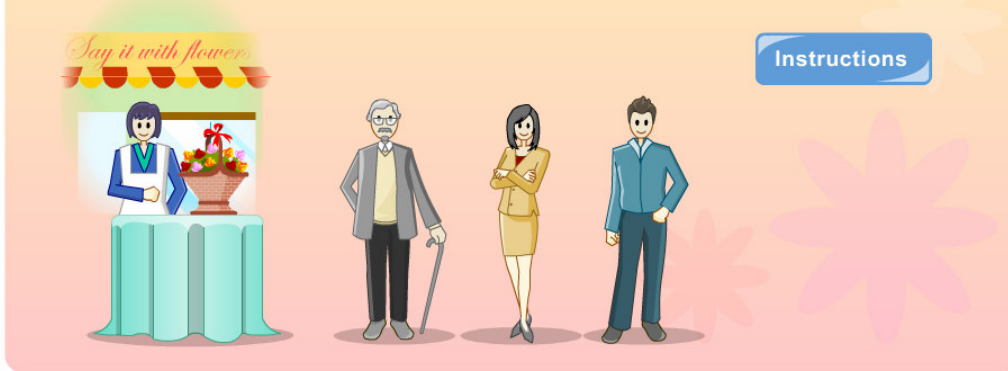
In another course teaching the concepts of supply chain management, we designed a game in which learners had to manage a supply chain to meet requirements of all entities involved. The message is very strong and the element of strategy makes this game highly instructional.

Given below is a brief summary of the different types of games, and when, why and how you should design these. Note that the order in which they appear in the table also indicates the level of difficulty in game design.

Game Type	Purpose	Description	Possibility For Reuse
Wrapper Only Quadrant I	Jazz value *Just Like That!*	The wrapper dresses up regular quiz questions in a non-contextual wrapper.	Once designed, these games can be used in any context.
Contextual Wrapper Quadrant I	Jazz value *Provides subtle messaging and relevance*	The wrapper is contextual and addresses the subject being covered in a subtle manner.	Since the wrappers are contextual, reuse is not easy, though possible if used in similar contexts.
Additional Strategy Element Quadrant II	Motivate *For content perceived as dull/boring*	The game anchors the main content, and allows the learner to strategize in order to maximize his/her score and earn rewards.	Possibility of reuse is similar to Contextual Wrappers
Focus on Message Quadrant III	Communicate an instructional message *For communicating abstract concepts*	Games designed around a key message, where the content itself is built into the game. However, such games are only meant to communicate an instructional message and do not have any major strategy to maximize the score.	Reuse is very difficult because the game is designed to communicate a specific message.
Combination of Message and Strategy Quadrant IV	Motivate and communicate an instructional message *For communicating tough concepts.*	Games designed around a key message, with an opportunity to strategize and maximize the reward/score.	Reuse in other contexts is not possible.

Summary

To conclude, before you include a game in your learning material, find out the purpose for including it. While you may include games for providing a jazz value, it is important to know that such games do not really motivate or communicate an instructional message.

Motivation and communication of an instructional message are two important components for making a game instructionally meaningful. Either of these two components has to be present in a game for it to qualify as an instructional game. While motivation can be addressed by creating a game as a separate layer from the content and building a strategy within it, communication can be addressed by building the game as part of the main content layer itself.

About the Authors

Purnima has been working as the Head of Knowledge Platform's instructional design function since 2003. She has almost thirteen years of experience in the field of computer-based training and instructional design. In addition, she has also designed and delivered many classroom training programs in instructional design.

Purnima has also written papers on instructional design and performance improvement, which have been published and presented in forums such as International Society of Performance Improvement (ISPI), American Society of Training and Development (ASTD) and Brandon Hall.

Puja Anand heads the E-learning business at Knowledge Platform. In the past, she has developed courses, taught instructional design and managed QA for large projects.

About Knowledge Platform

Knowledge Platform is one of Asia-Pacific's leading instructional design, E-learning content development and learning technology solutions companies. Established in early 2000, Knowledge Platform has offices in Singapore, Tokyo, Delhi and Islamabad. By providing services such as E-Learning Content, Instructional Design, Training Solutions, and E-Learning Technology Solutions, Knowledge Platform helps its clients to increase their learning efficiency. Knowledge Platform has a rapidly growing, blue chip enterprise, banking, educational, and government sector client base.

The products division of Knowledge Platform specializes in creating generic and proprietary e-learning products on subjects relating to business processes that enhance operations and reduce risk. The company has demonstrated leadership as a valued resource, subject matter expert and service provider in the areas of compliance including information security and privacy, code of conduct and anti-money laundering.

Let Knowledge Platform assist your company in designing and developing appropriately interactive E-Learning Content. You can reach us at +65 6325 9727.