Gamification:

Creating Engaged Learners

By Karl M. Kapp
Bloomsburg University
Author of Gamification of Learning &Instruction

Follow on Twitter:@kkapp for updates, slides & additional ideas.

For:

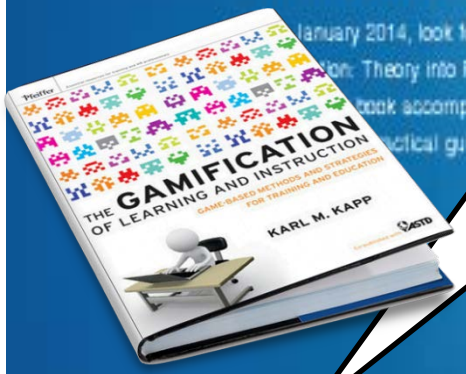
Notes

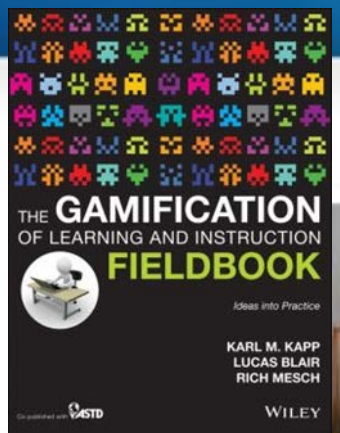
Slides

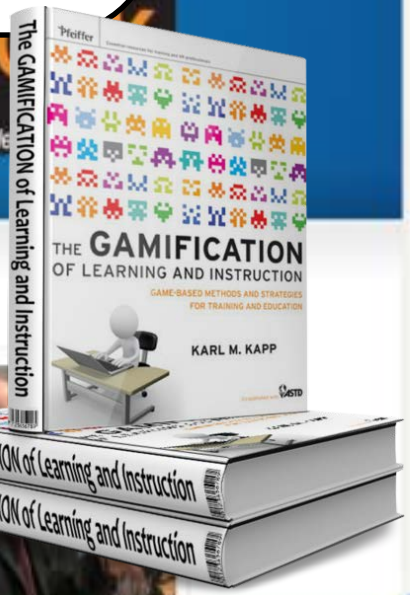
Additional Ideas

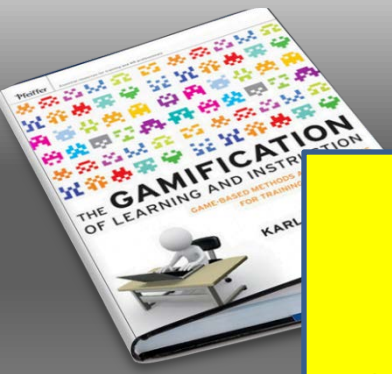
www.karlkapp.com

www.karlkapp.com/kapp-notes





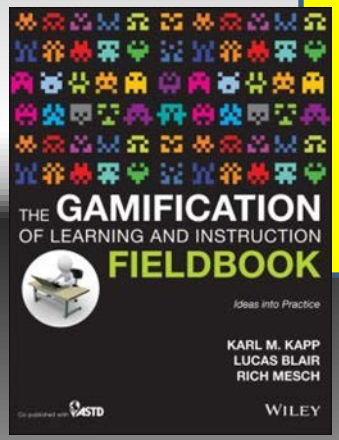


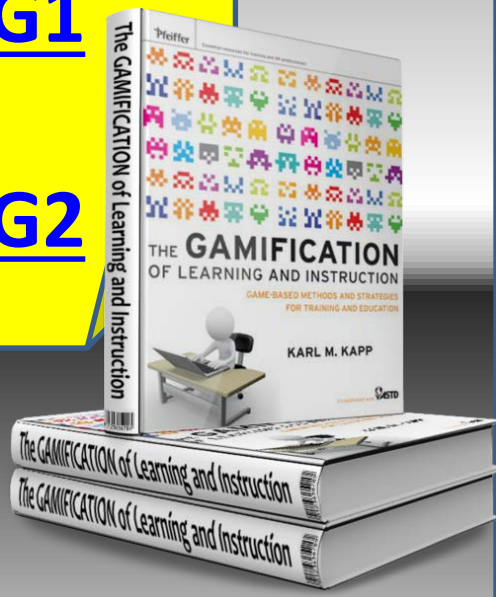


Some helpful books
on Gamification

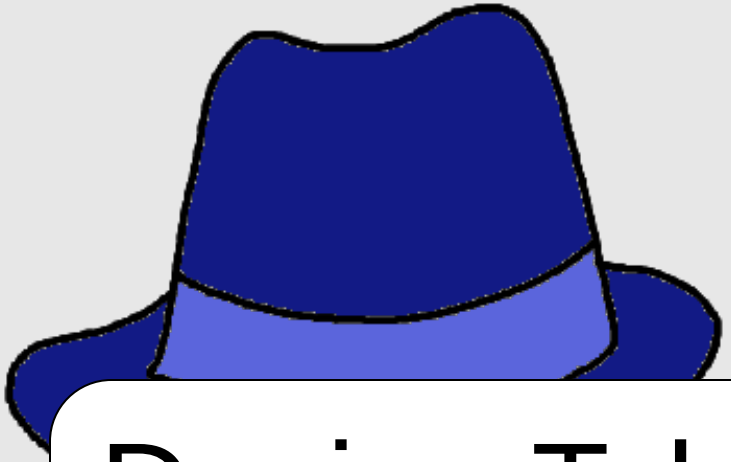
http://tinyurl.com/KappbookG1

http://tinyurl.com/KappbookG2





Karl M. Kapp Presents:



Design Takeaway Challenge

Gamification: The Mystery of Learner Engagement

It was a quiet Monday morning, very quiet, really quiet… almost too…

Then, out of nowhere, she flew into my office, like a Boss who had a problem that needed solved …


I have a problem that needs to be solved.

She wanted to increase learner engagement.


You came to the right guy
that's what I do…


Now take the new person here and go ask Clyde, he went to a NASBA session on the subject.

For some reason, she didn't seem bothered by the fact that she was breaking the company's strict no smoking policy…

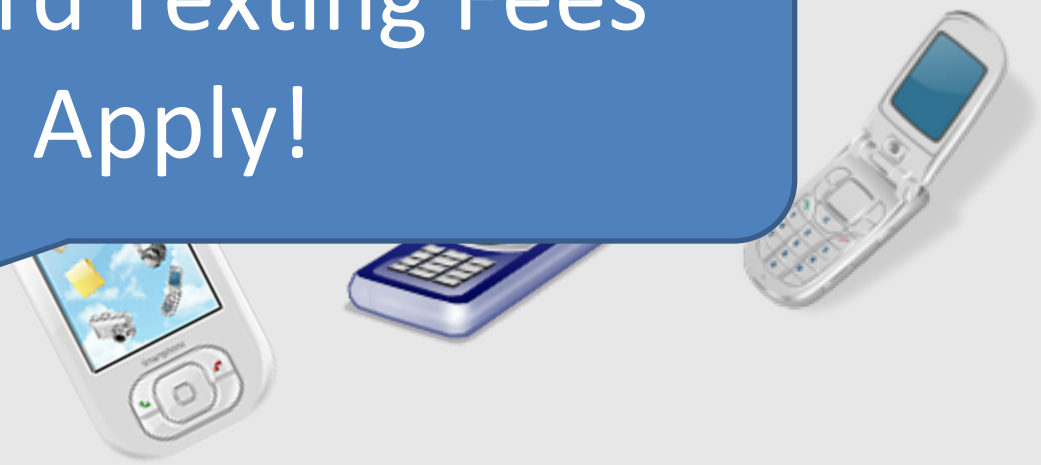
Here's where you come in. Help me figure out the clues ...and fast.

Instructions

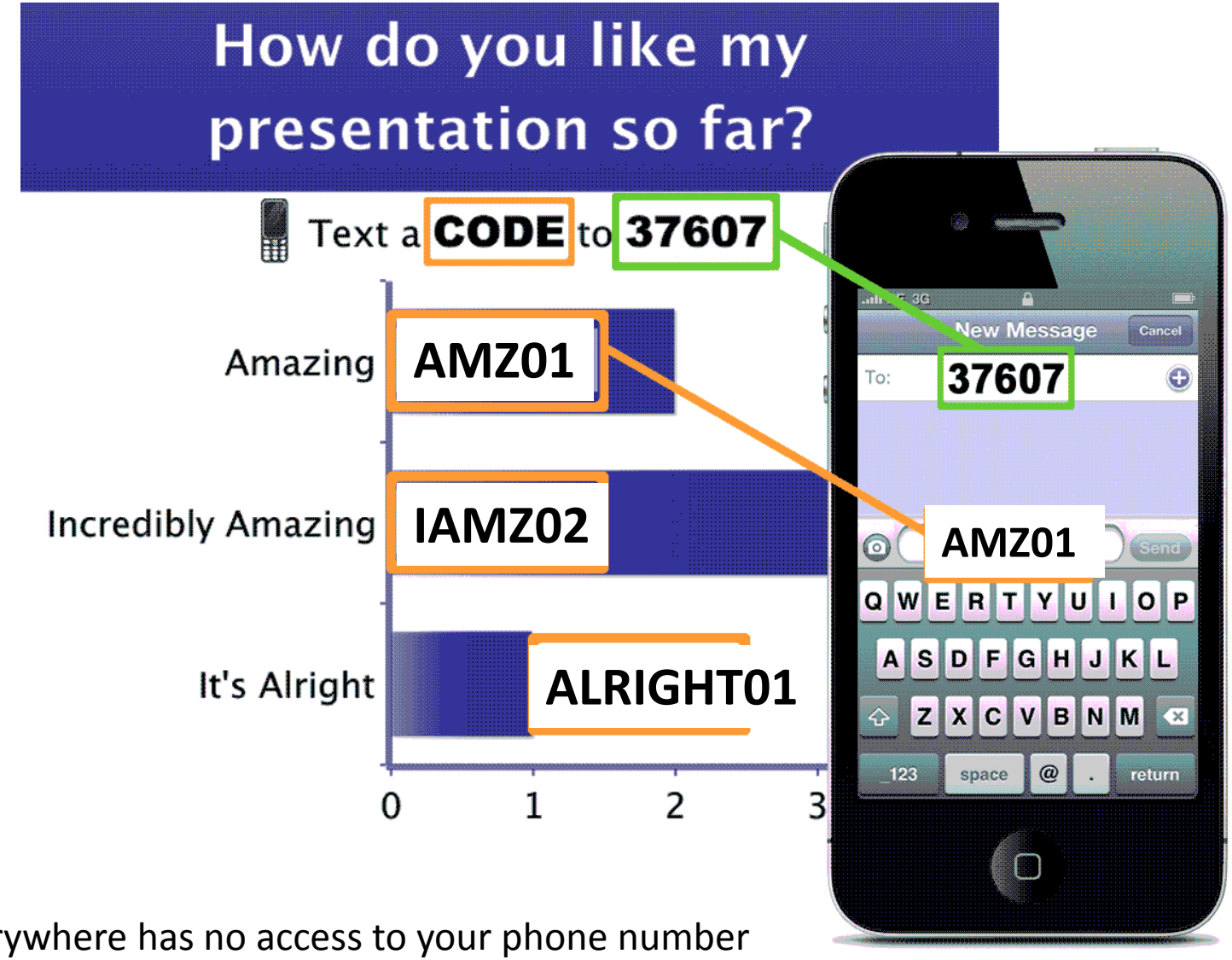
- A statement is presented
  - Type in “Code word”
- Text Response:

Take out your text-machines

Standard Texting Fees Apply!



How To Participate via Texting



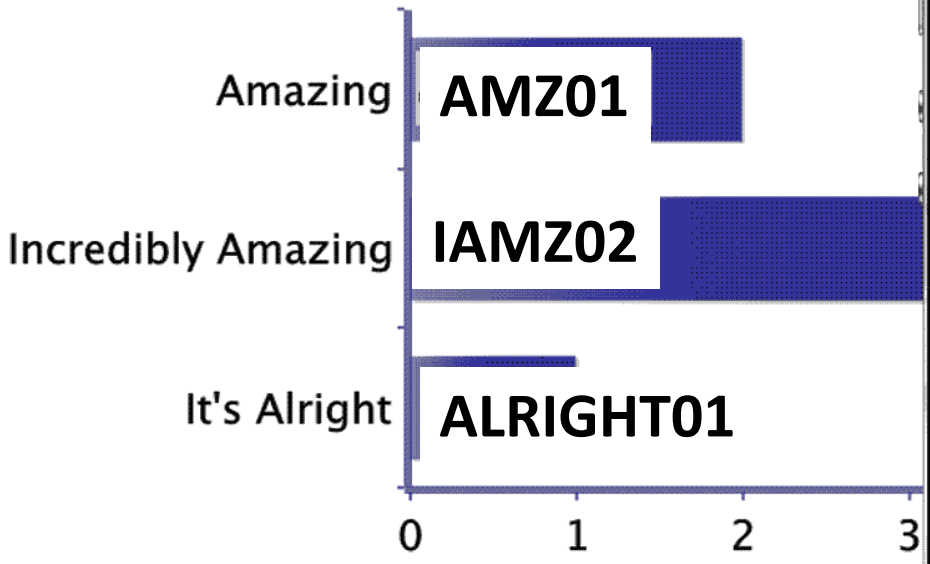
1. Polleverywhere has no access to your phone number
2. Capitalization doesn't matter, but spaces and spelling do

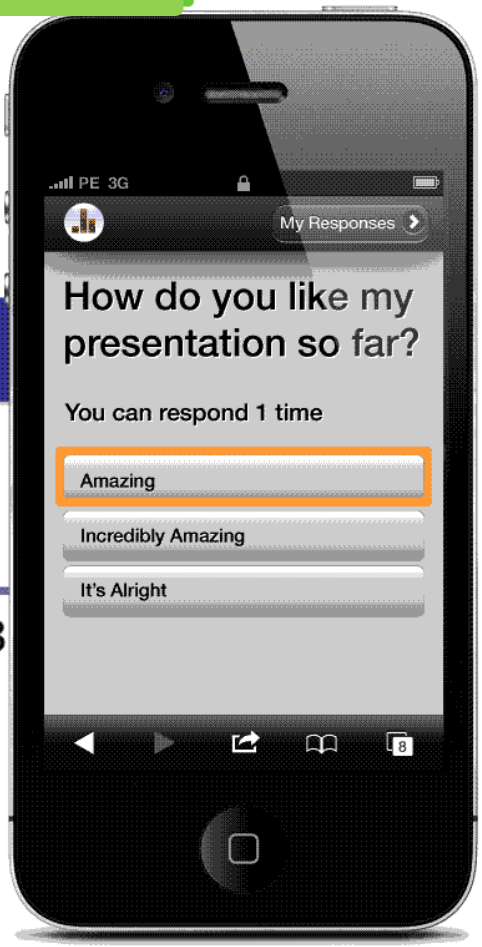
How To Vote via PollEv.com/karlkapp

How do you like my presentation so far?

Submit responses at **PollEv.com/karlkapp**

Text a **CODE** to **37607**





TIP | Capitalization doesn't matter, but spaces and spelling do

How To Participate via Observation

Observe the process:

-What design techniques are used?

-What elements add to the experience?

-What instructional design principles are being followed or broken?

Choose your disguise…

Stakes are high……


The GAMIFICATION of Learning and Instruction
THE GAMIFICATION OF LEARNING AND INSTRUCTION
KARL M. KAPP
First stop…Clyde's office…look for clues

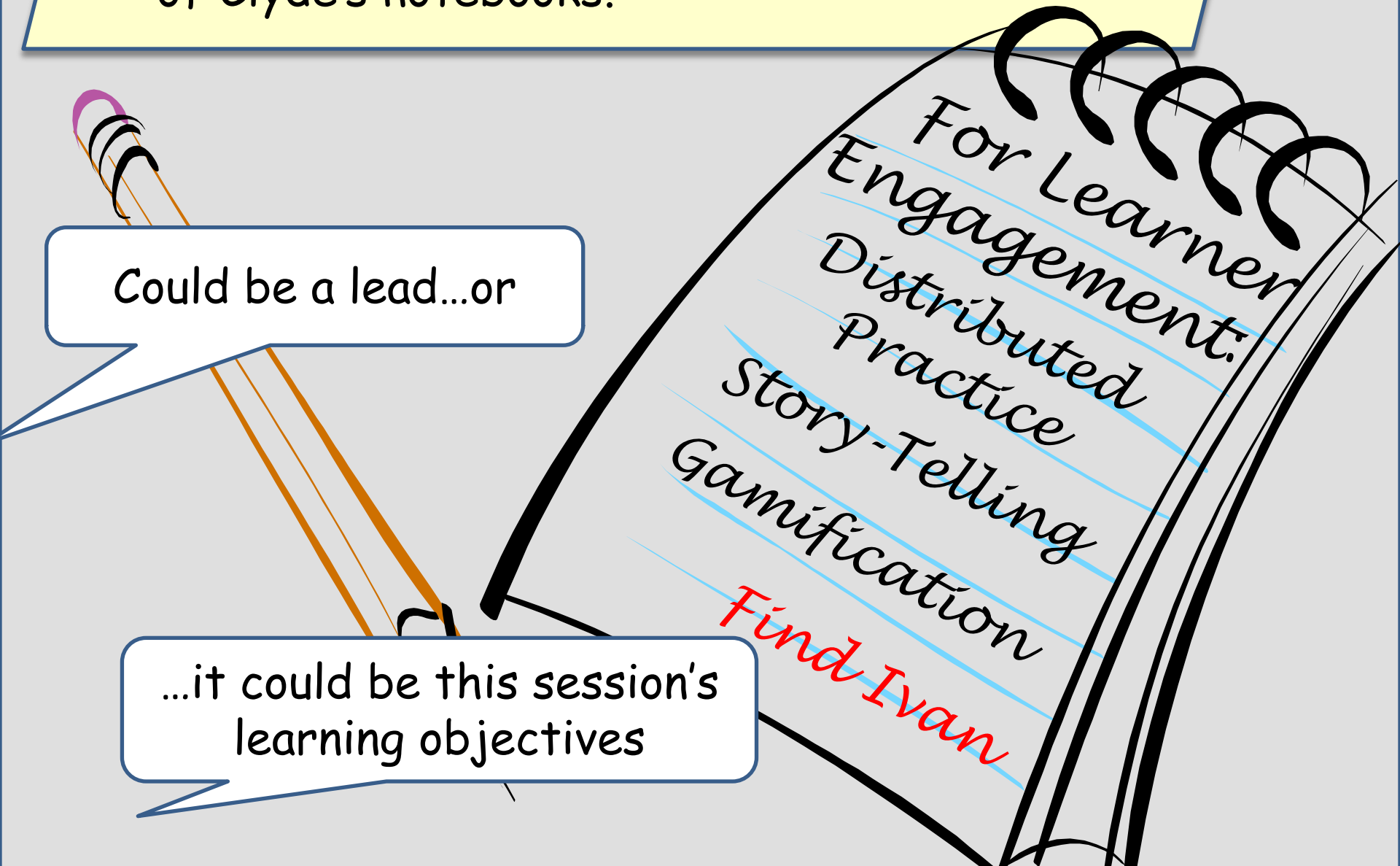

Games and
Gamification
are the
same thing?

Gamification uses parts of games but is not a game itself.

Game-based Learning is teaching using a self-contained game.

Definite beginning, middle and end.

Look…I found some things written on one of Clyde's notebooks.



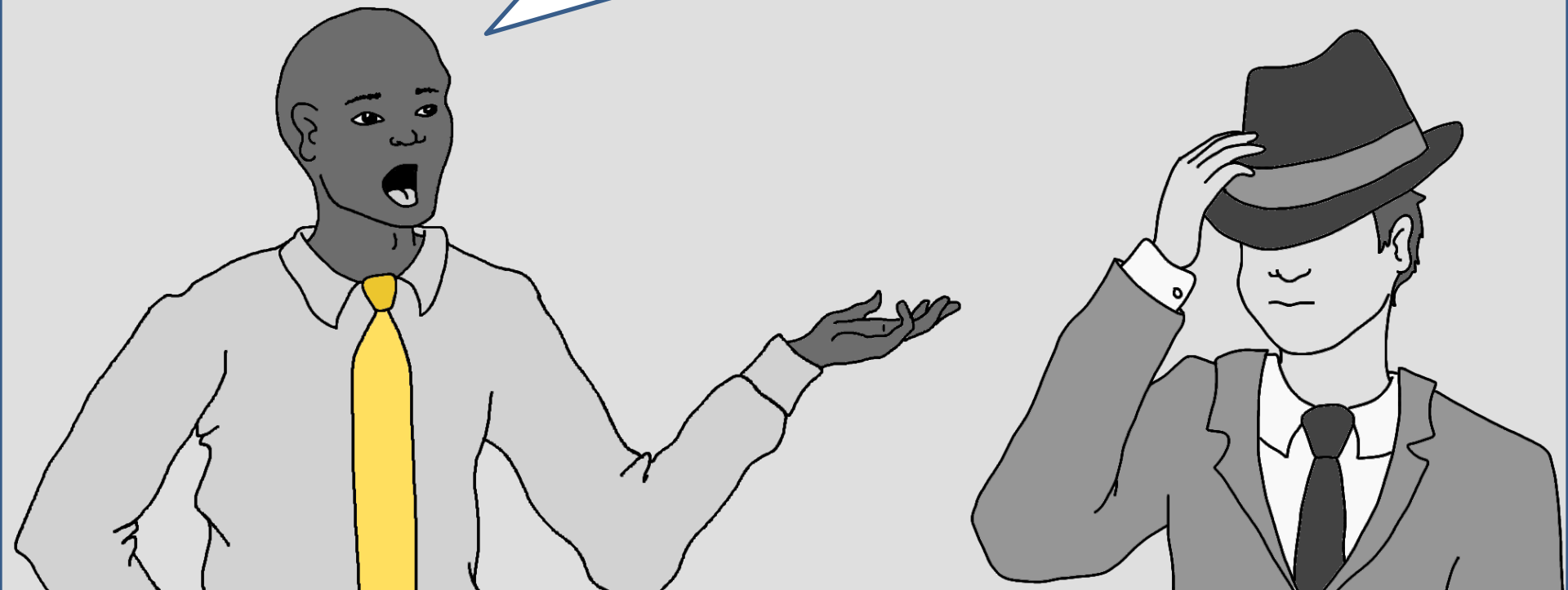

Let's get going.

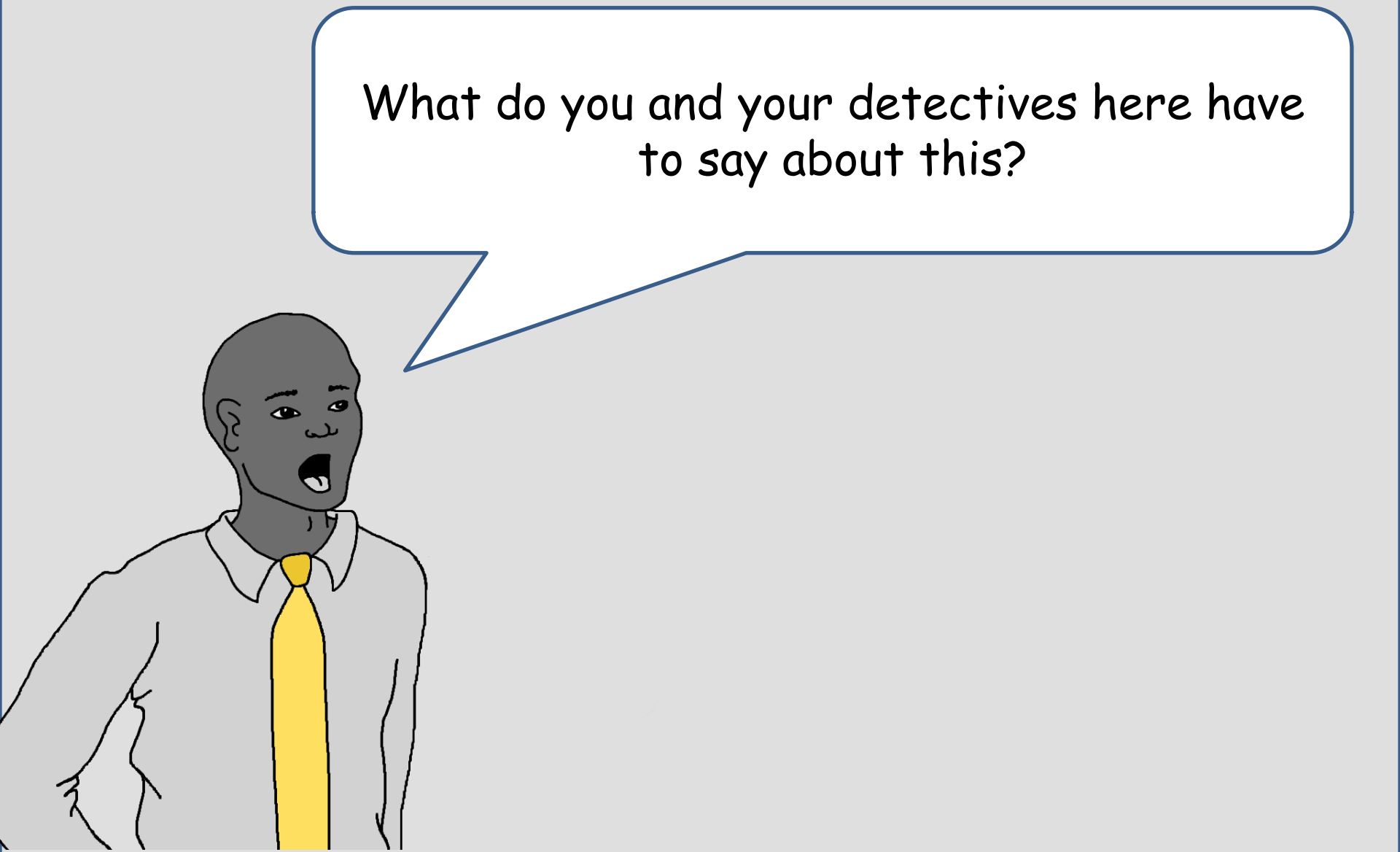

Now we need to find Ivan…the Informant…
I knew one of his old haunts.

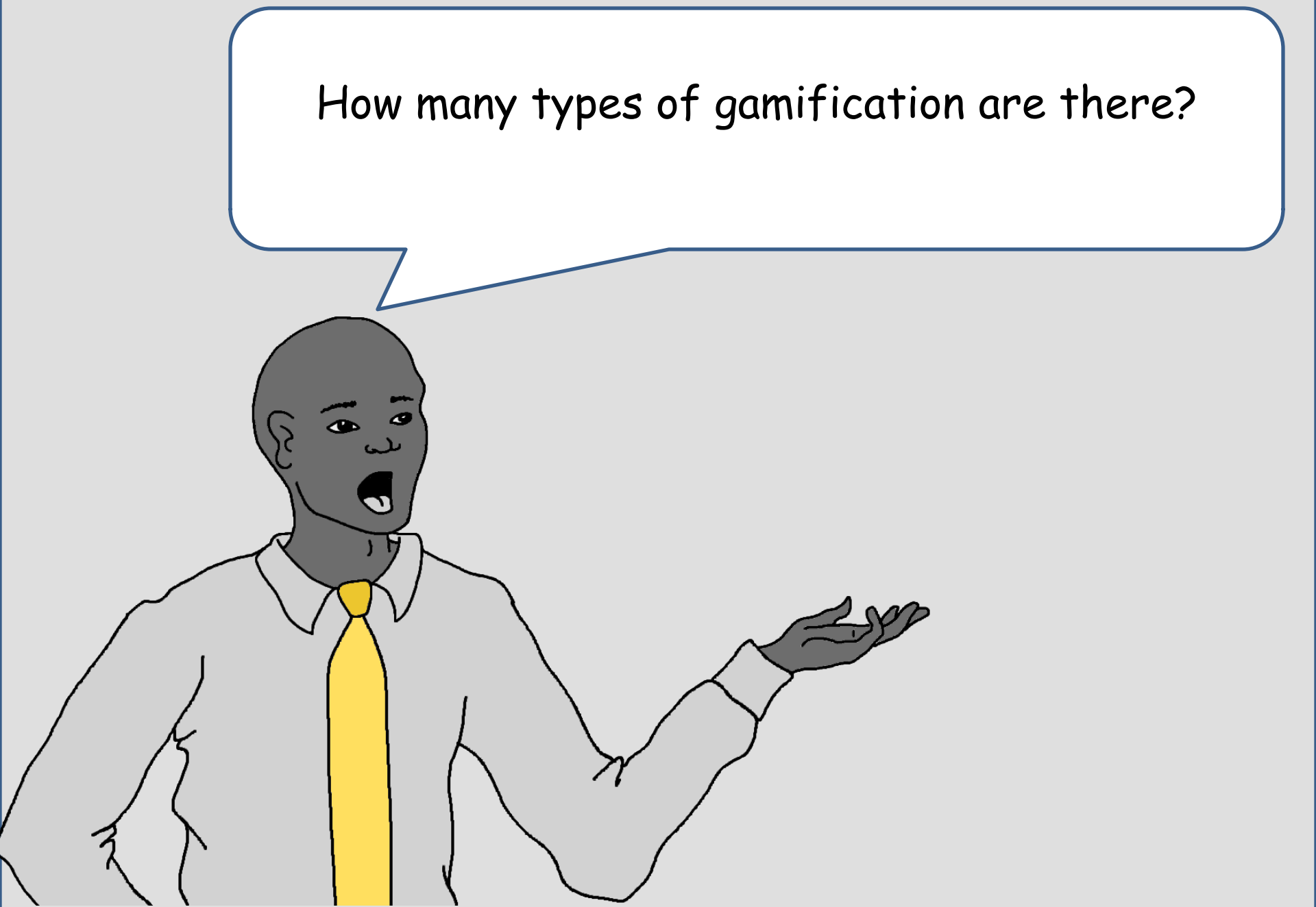
He was about as friendly as a fly at a fly strip convention.

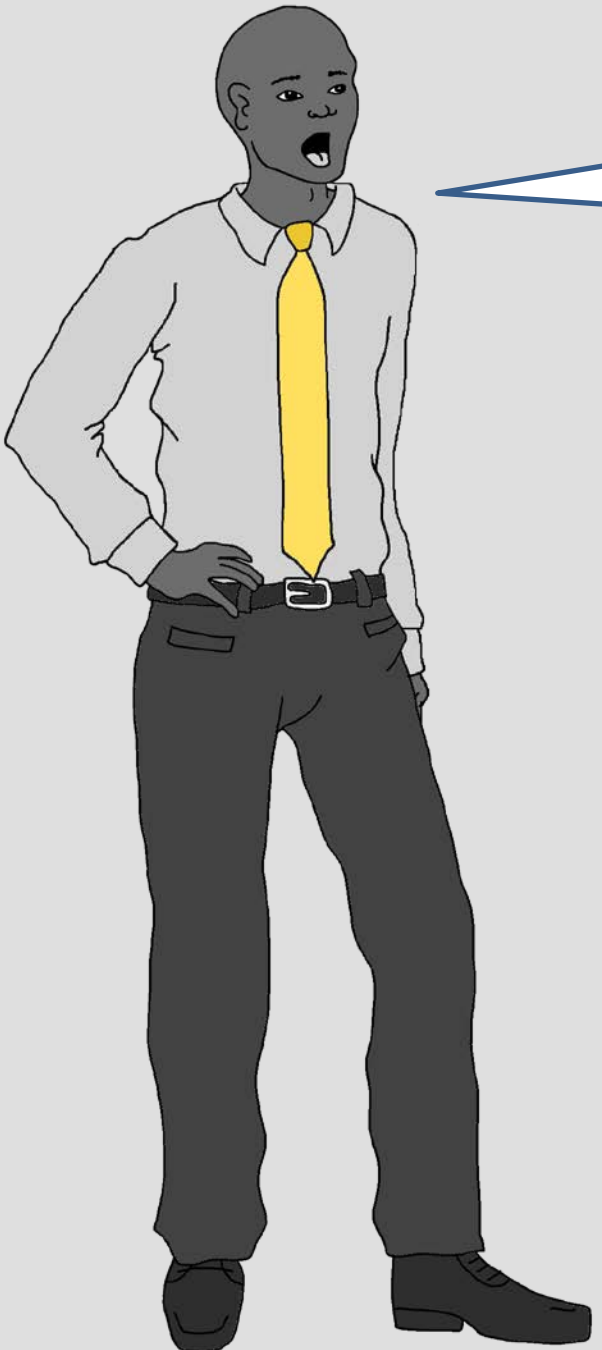
He was about as friendly as a fly at a fly strip convention.

Look I am going to ask you some questions, the right answer gives you a clue to gamification and interactive learning.




What do you and your detectives here have to say about this?


How many types of gamification are there?



There are two types of gamification.

He grabbed his typewriter and made some notes to explain to me the difference between the two types of gamification.

Structural Gamification is use of game-elements to propel a learner through content with no alteration or changes to the content.

Structural:

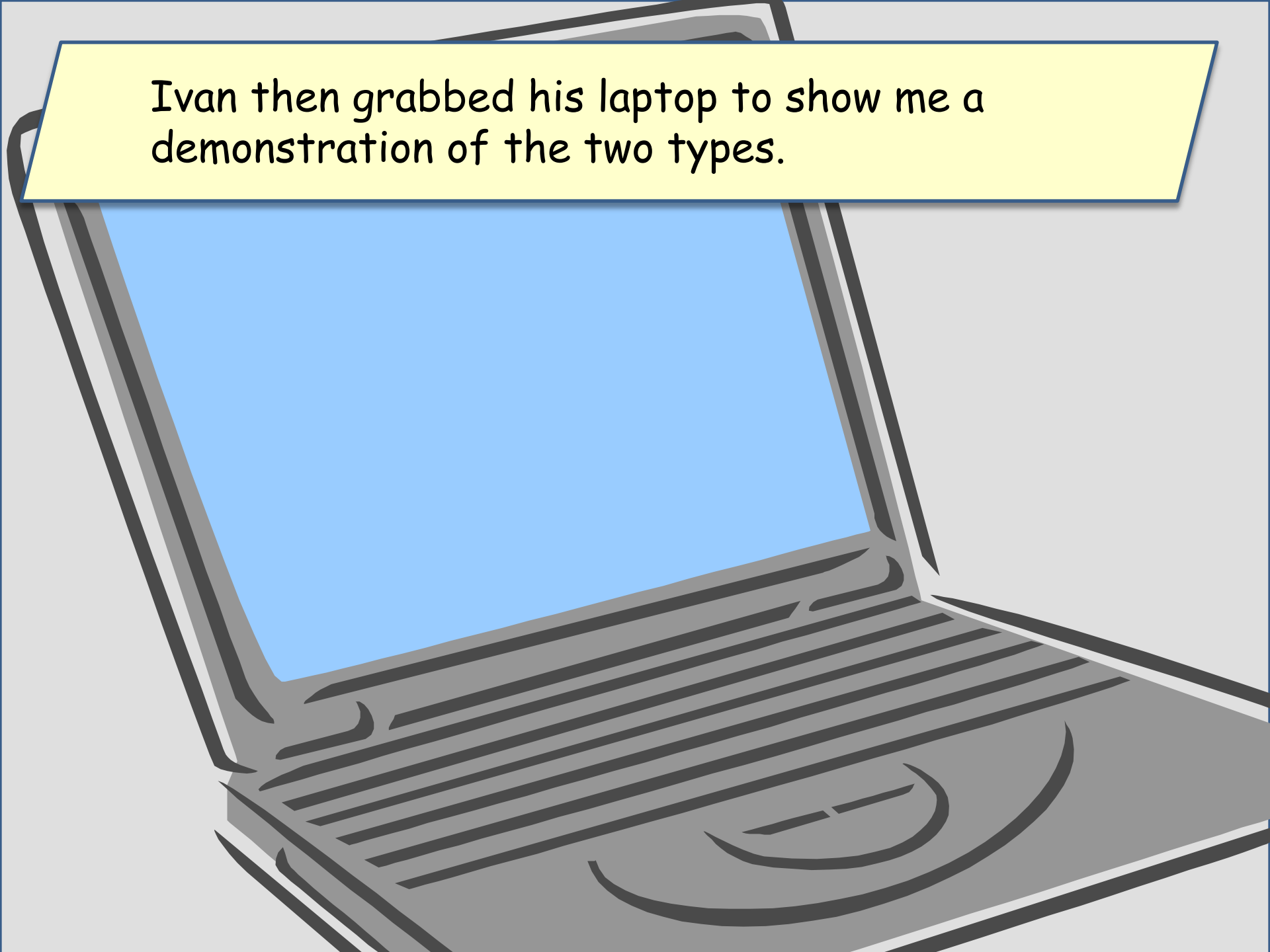
- Points
- Badges
- Leaderboard

Content Gamification use of game thinking to alter content to make it more game-like but doesn’t turn the content into a game.

Content:

- Challenge
- Story
- Characters
- Missions

Ivan then grabbed his laptop to show me a demonstration of the two types.



https://aicpa.mindtickle.com

AICPA

First Structural Gamification….

Karl M. Kapp
2430

KNOWLEDGE SCORE

Scott Wiley
2700

Kathy Johnson
2700

Allison Forrest
2690

Jeff White
2680

UPDATES

Karl M. Kapp completed How Professionals will Learn

Karl M. Kapp earned Beginner Badge in How Professionals will Learn

Karl M. Kapp completed How Professionals will Learn

LEARNING BOARD

All ▾ Search

How Professionals will Learn

100

Flipped Classroom

300

Coursera Case Study

1610

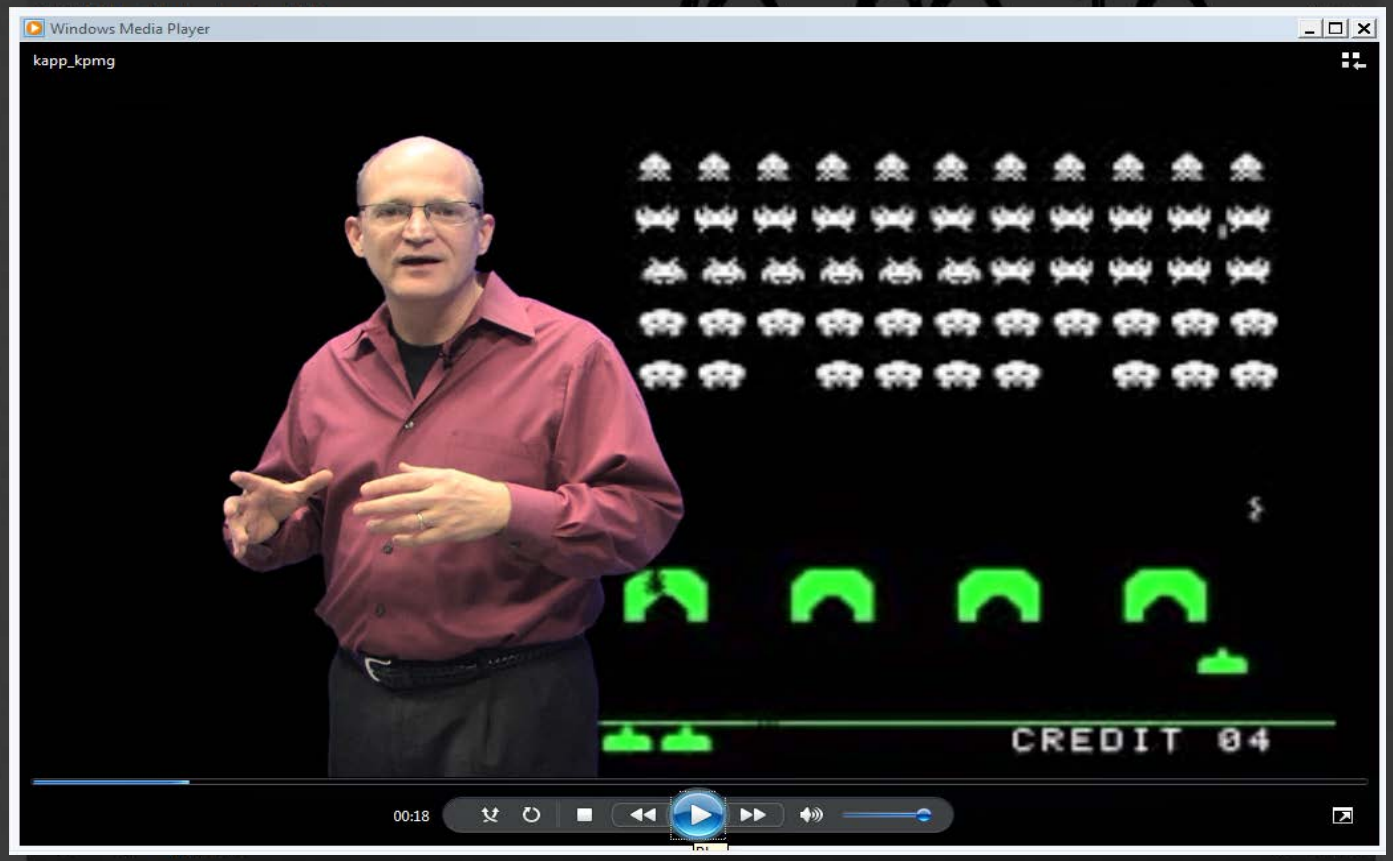
General session

1

2020 Workplace

320

Screen captures courtesy of MindTickle….



Gamification

The concept of gamification Consists of many different elements.
These elements can include:

- Story
- Character
- Mystery
- Curiosity
- Curve of Interest
- Surprise
- Chance
- Points
- Badges

Flipped Classroom

Back to Learning Board

Flipped Classroom

Level 1: Level 1

EXPERT

Current Score : **300**

Exit | Re-attempt | Review

https://aicpa.mindtickle.com/526/

Big - Bang Disruption (Optional)

Beginner 290

Q1 Q2 Q3

Q

What are some ways for incumbents to survive big-bang disruptions? (mark correct answers):

A

- [ ] Finding and listening to a truth teller
- [ ] Delaying profitability of disrupters
- [ ] Going back to school for a PhD
- [ ] Having an exit strategy
- [ ] Hiring your competition's CEO
- [ ] Diversifying

Lifelines 3 ✕ ✕ ✕

SKIP

https://aicpa.mindtickle.com/567/

70-20-10 learning model

Beginner 150

Factopedia | Discussions | Hall Of Fame

70-20-10 learning model

A short presentation on the 70-20-10 learning model.
Blended Learning: Learn through education, exposure and experience.

BLENDED LEARNING

Congratulations

With 150 pts you won

Beginner Badge

and accrued

+3 Lifelines

Lifelines 6

Resume

+ 100 Next

https://aicpa.mindtickle.com

AICPA

Discussions Participants

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All ▾ Search

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1610

General session

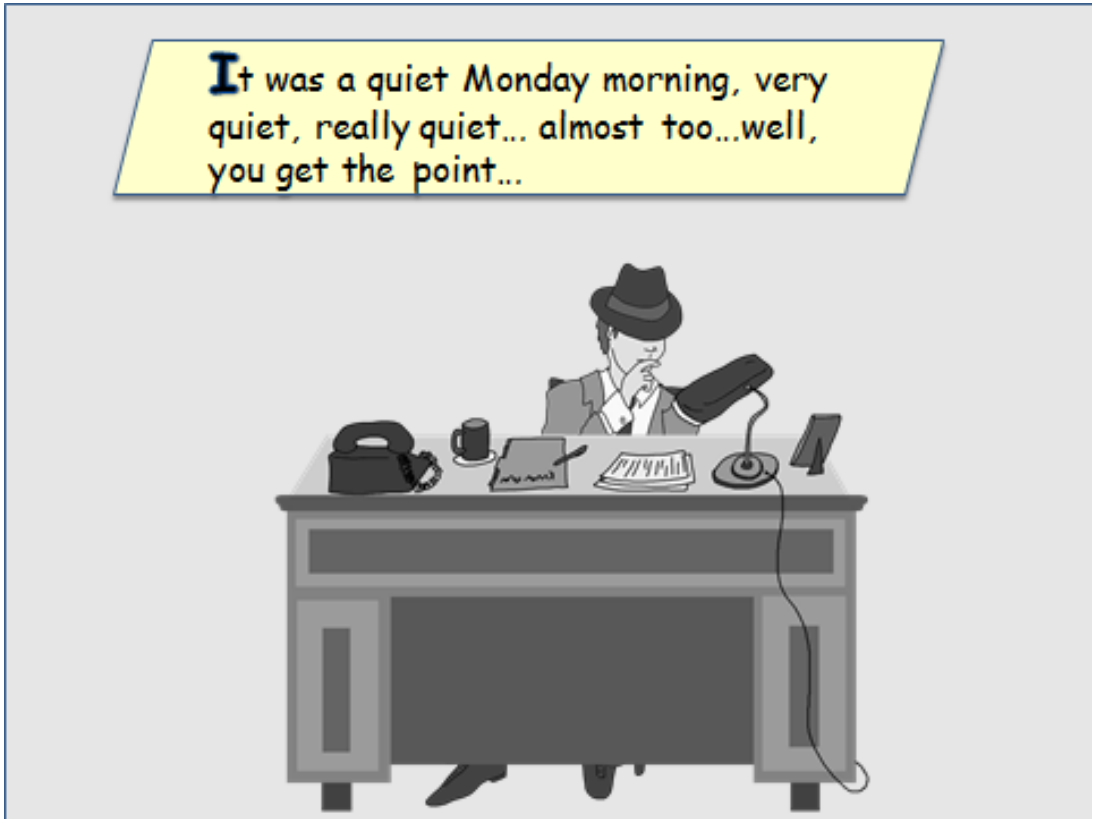
100

2020 Workplace

320

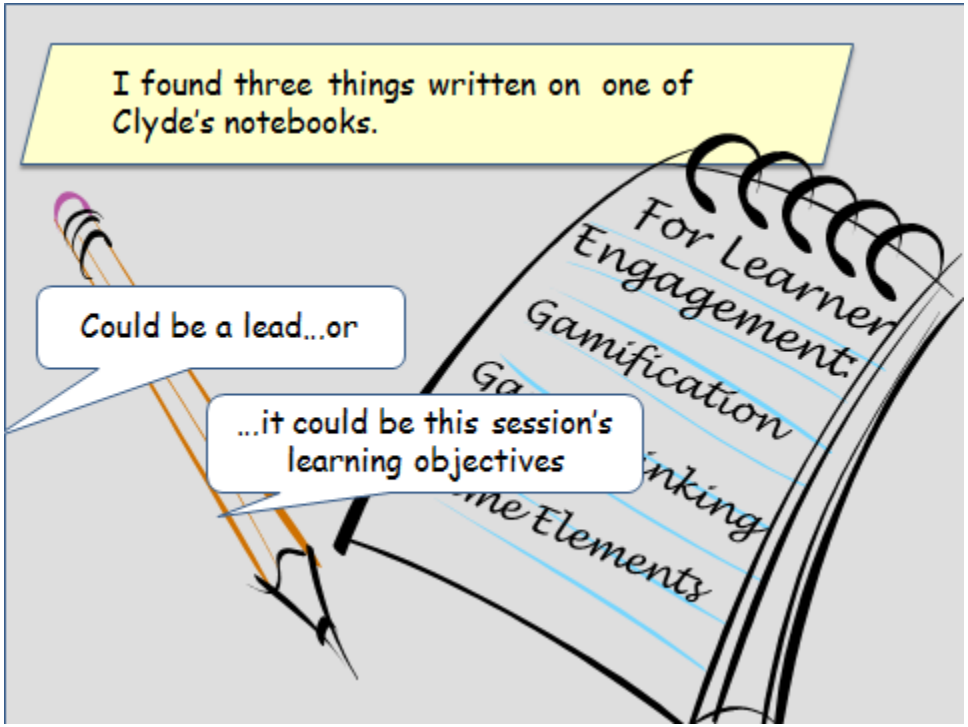
Then he demonstrated content gamification....

It was a little like déjá vu ….this content gamification…..



It has elements of story, characters and content that was altered to be more game-like…

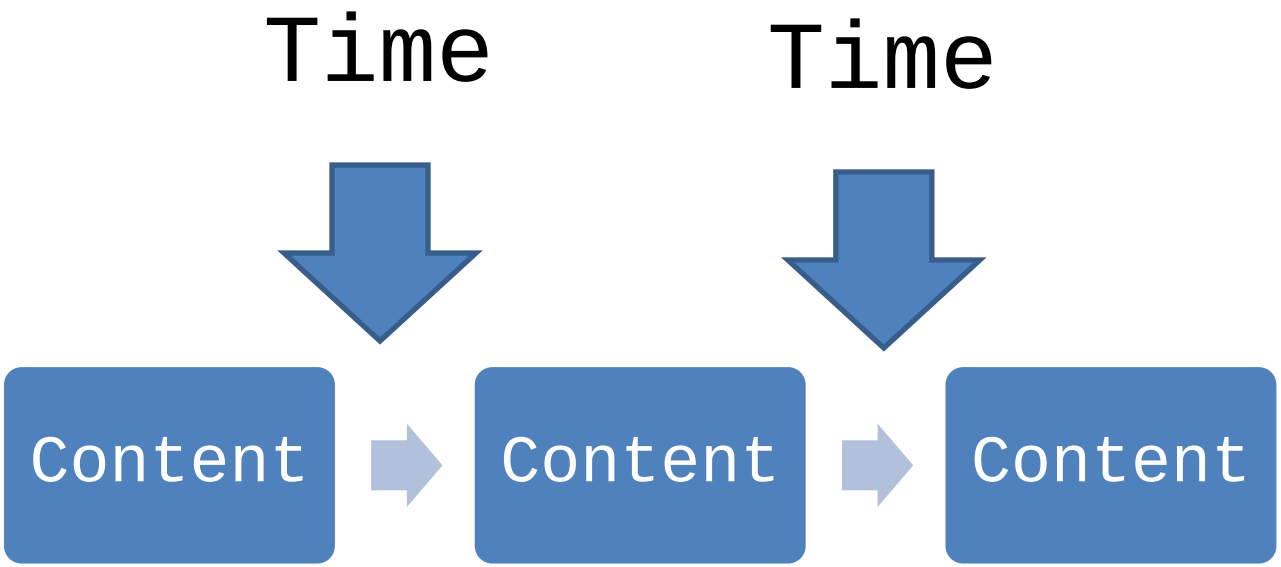
This mystery of interactive learning was starting to take shape…



Twittermission

Ok, now let's get into the research!

Riddle me this…which is a better way to learn, studying a little bit of content at a time or learning it all in one big chunk of time?


Time
Time
Content
Content
Content

Spaced Retrieval

helps learners retain access to memorized information over long periods of time.

The spacing promotes deeper processing of the learned material.

Ha…I know this! Space learning out in small chunks over time, 24 hours is the optimal spacing.

Some call it "drip learning."

Break up content in classroom every 8-10 minutes.

In fact, a study using a randomized control group conducted a trial at ten sites in southeast India with over 500 subjects.

Working Indian men (aged 35—55 years) with impaired glucose tolerance were randomly assigned to either a mobile phone messaging intervention or standard care.

Ramachandran, A. et. al. **Effectiveness of mobile phone messaging in prevention of type 2 diabetes by lifestyle modifica m India: a prospective, parallel-group, randomised controlled trial** The Lancet Diabetes & Endocrinology, Early Online Public 11 September 2013 doi:10.1016/S2213-8587(13)70067-6

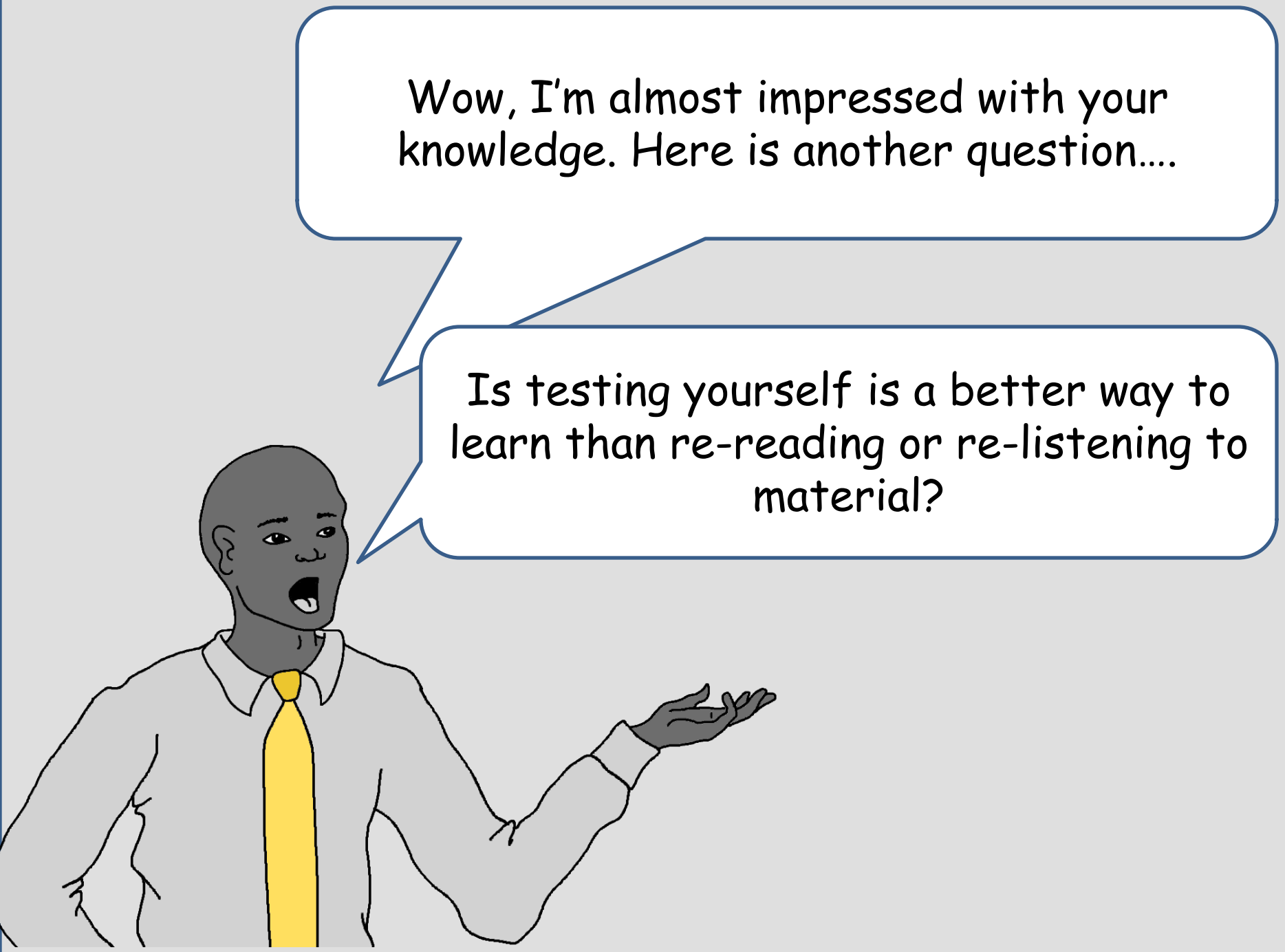
"Use stairs instead of an Elevator"

"Avoid snacks while watching TV; you may overeat."

Ramachandran, A., et. al.., **Effectiveness of mobile phone messaging in prevention of type 2 diabetes by lifestyle modification in men in India: a prospective, parallel-group, randomised controlled trial** The Lancet Diabetes & Endocrinology, Early Online Publication, 11 September 2013 doi:10.1016/S2213-8587(13)70067-6

Lowered risk of developing Type 2 diabetes by 36%.

Ramachandran, A., et. al.., **Effectiveness of mobile phone messaging in prevention of type 2 diabetes by lifestyle modification in men in India: a prospective, parallel-group, randomised controlled trial** The Lancet Diabetes & Endocrinology, Early Online Publication, 11 September 2013 doi:10.1016/S2213-8587(13)70067-6


Wow, I'm almost impressed with your knowledge. Here is another question….
Is testing yourself is a better way to learn than re-reading or re-listening to material?

It's a fact: "Retrieval Practice" alone can provide improved recall performance by as much as 10-20%.

Require students to recall content to enhance learning.

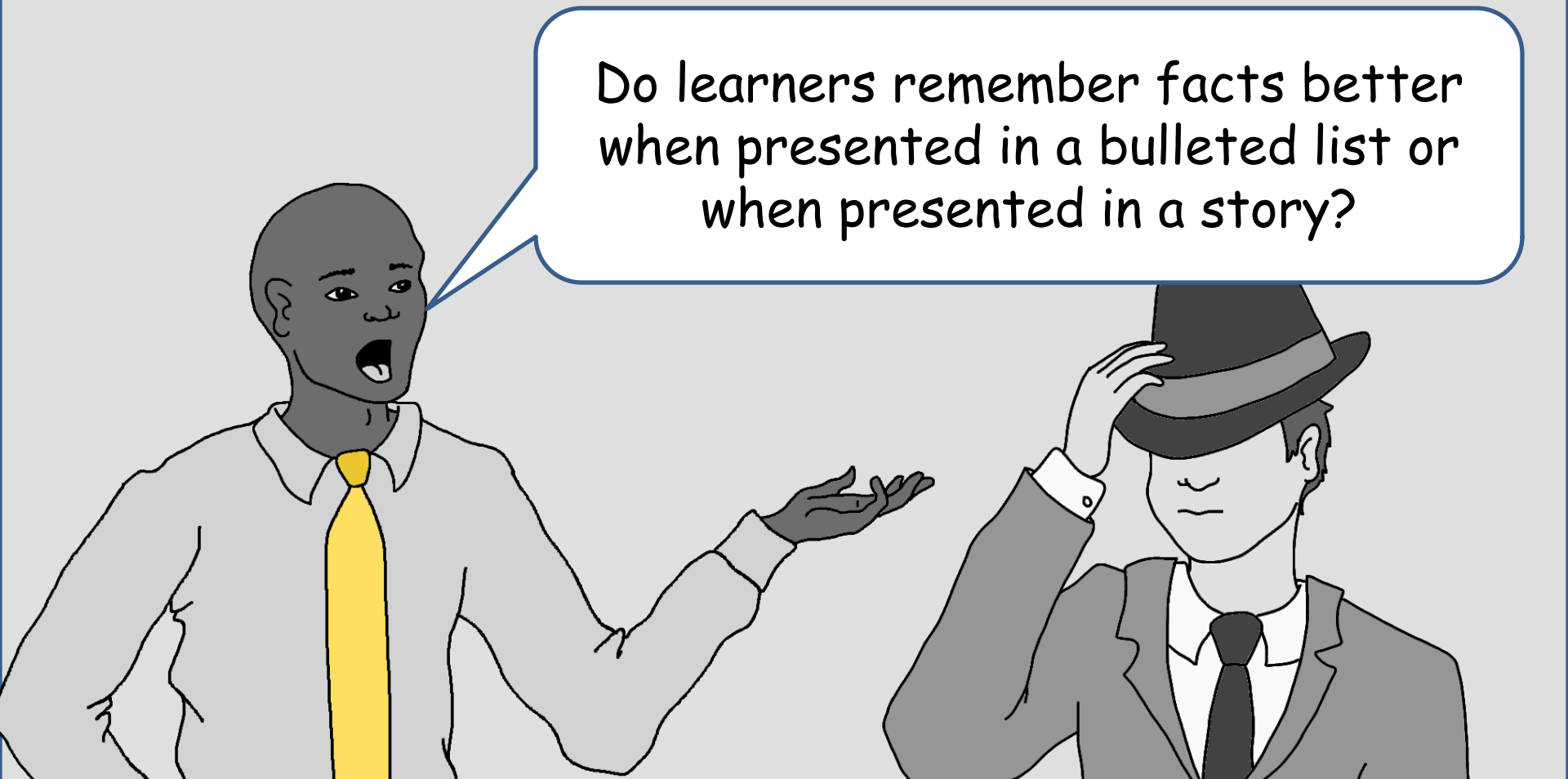
In other words, use testing to reinforce learning—not just for evaluation.

Combining Spaced Retrieval and Retrieval Practice is really powerful.

One study in the subject of Anatomy and Physiology revealed retention benefits of between 35% and 61% with average of 41%.

Dobson, J. L. (2013) Retrieval practice is an efficient method of enhancing the retention of anatomy and physiology information *Advances in Physiology Education* 37: 184–191, 2013; doi:10.1152/advan.00174.2012

Ivan had another question for me…I was the one who was supposed to be ask'n questions….



Researchers have found that the human brain has a natural affinity for narrative construction.

People tend to remember facts more accurately if they encounter them in a story rather than in a list.

Again with the computer….

myLOCKER ORDER STATUS CART 0

MY NIKE+ LEVEL: GREEN

TOTAL

276.86 MI

344mi to reach the next level. What are levels?

sec run at 7:34 AM

HOW WAS YOUR RUN?

03/24
03/25
04/02
04/03
04/06
04/09
04/16

SEE ALL RUNS

FASTER

DISTANCE

9.56 MI

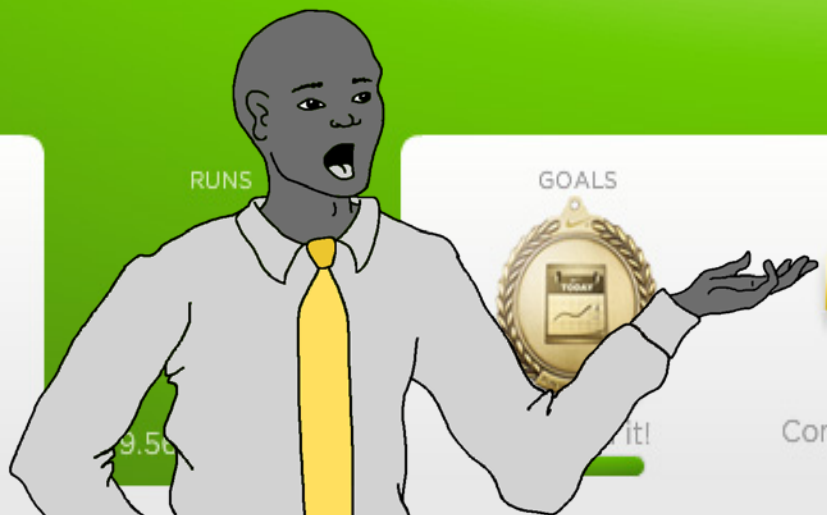
RUNS

GOALS

CHALLENGES

COACH

MINI



Compete With Friends

Train Like a Pro

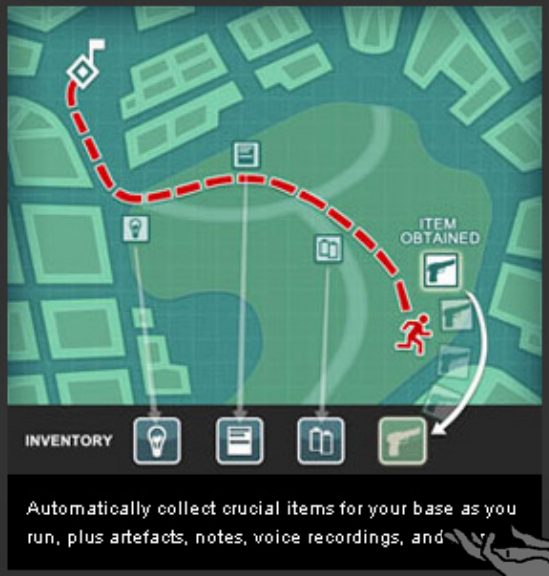
Let's turn it up a Notch!

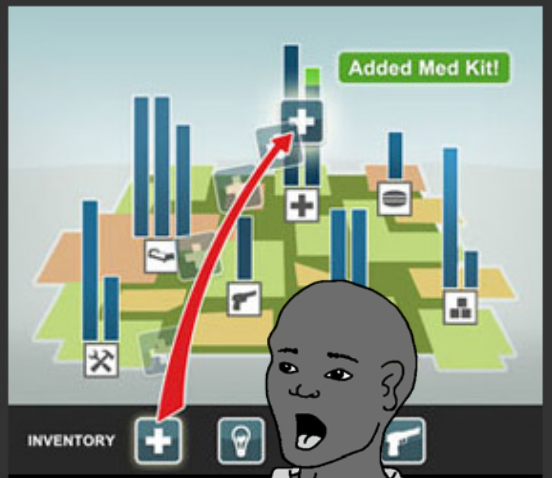
THE GAME

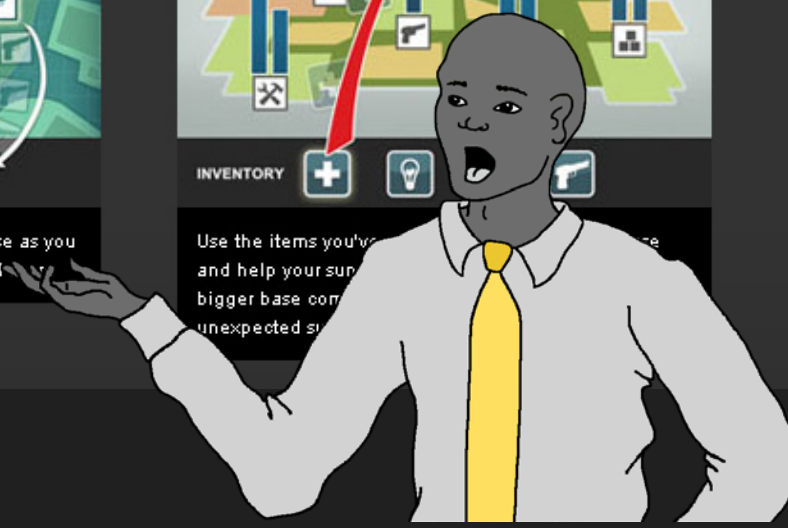
You tie your shoes, put on your headphones, take your first steps outside. You've barely covered 100 yards when you hear them. They must be close. You can hear every guttural breath, every rattling groan - they're everywhere. Zombies. There's only one thing you can do: **Run!**

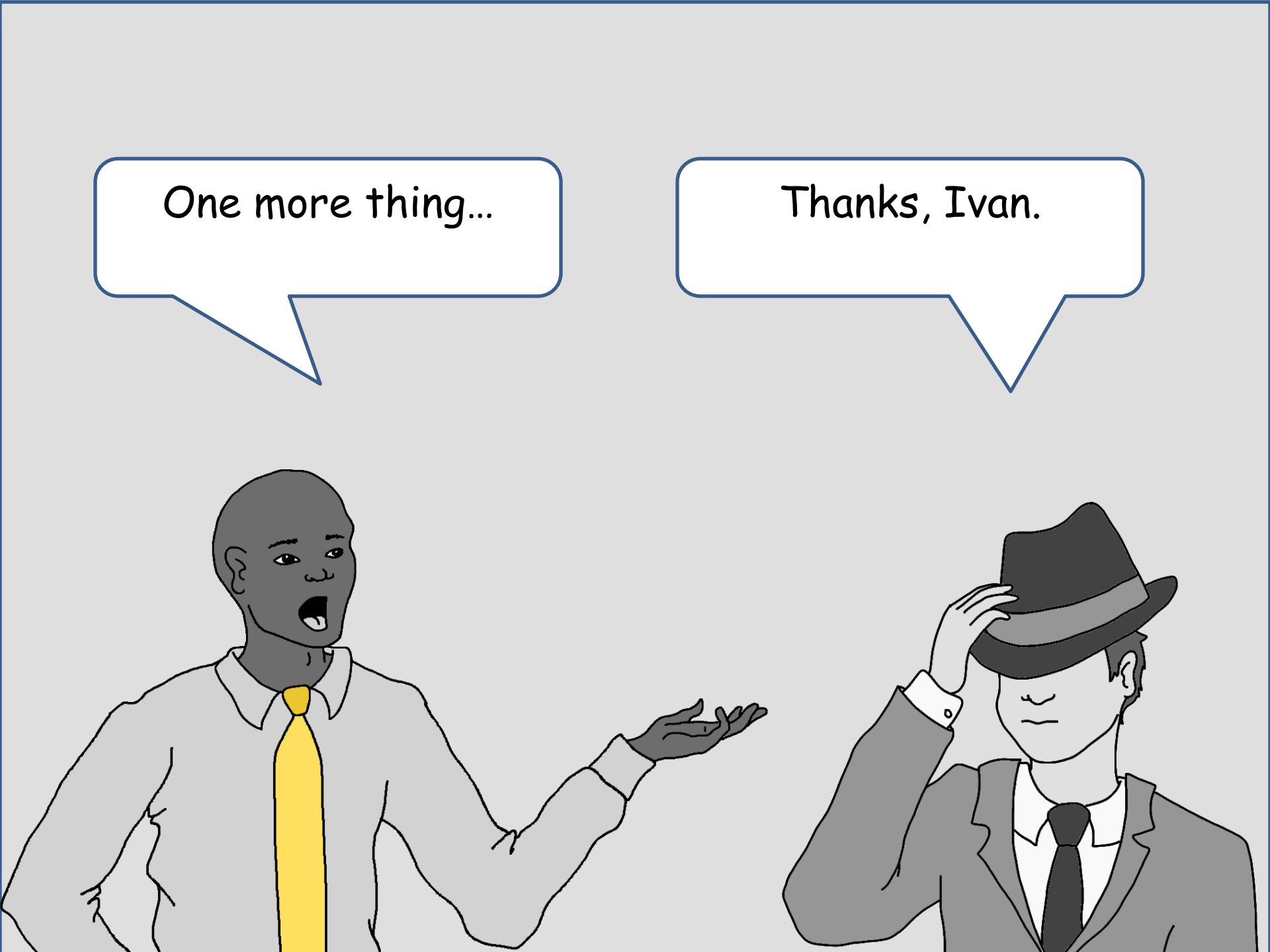
THE STORY

You're Runner 5. Hundreds of lives are counting on you. You've got to help your base rebuild from the ruins of civilization by collecting critical supplies while avoiding roving zombie hordes. Can you save them and learn the truth about the zombie apocalypse?

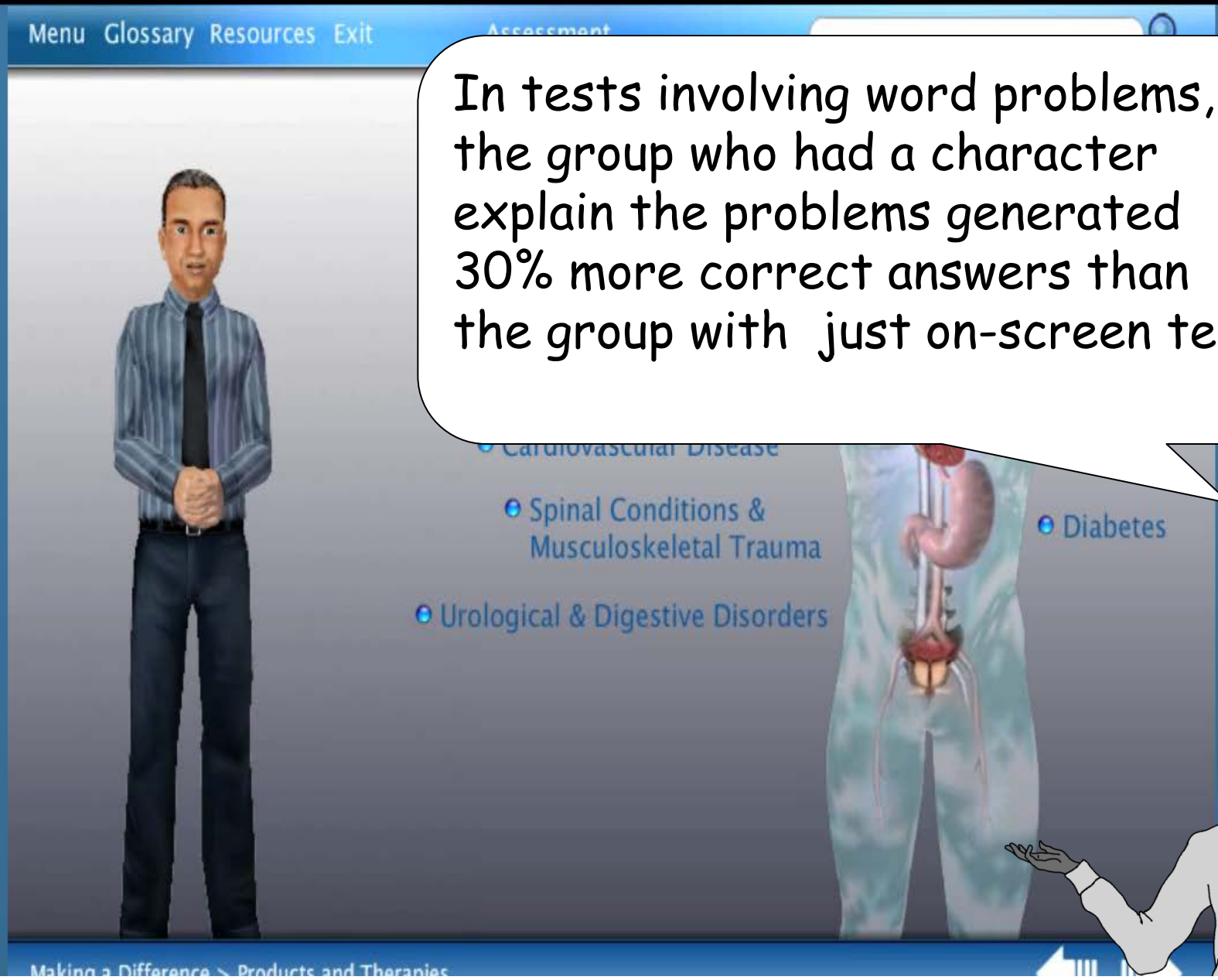




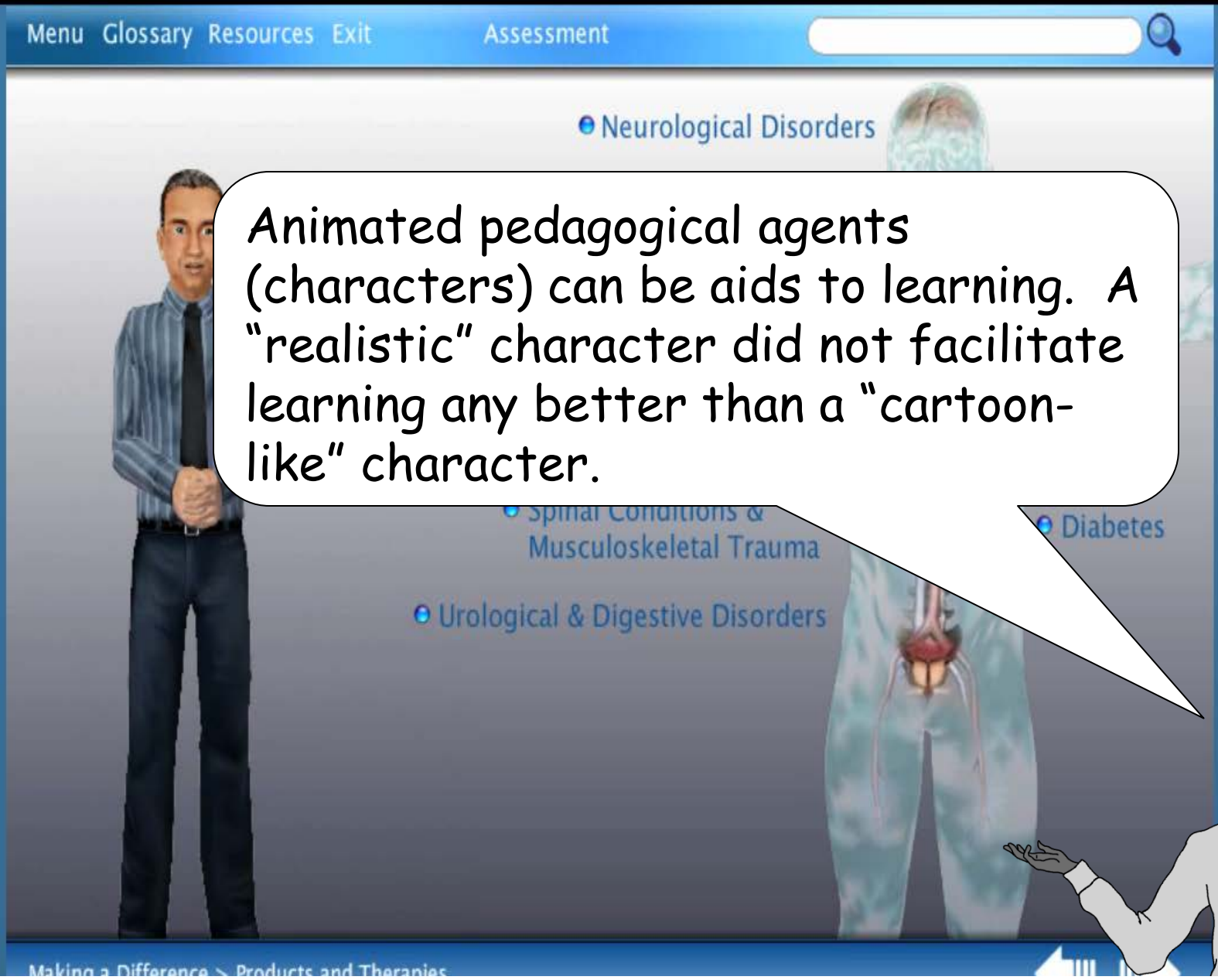



One more thing…
Thanks, Ivan.


Add character's to your learning designs...



Clark, R., Mayer, R. (2011) E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning. New York: Pfeiffer. Pg. 194. Chapter 4 "The Gamificaiton of Learning and Instruciton"



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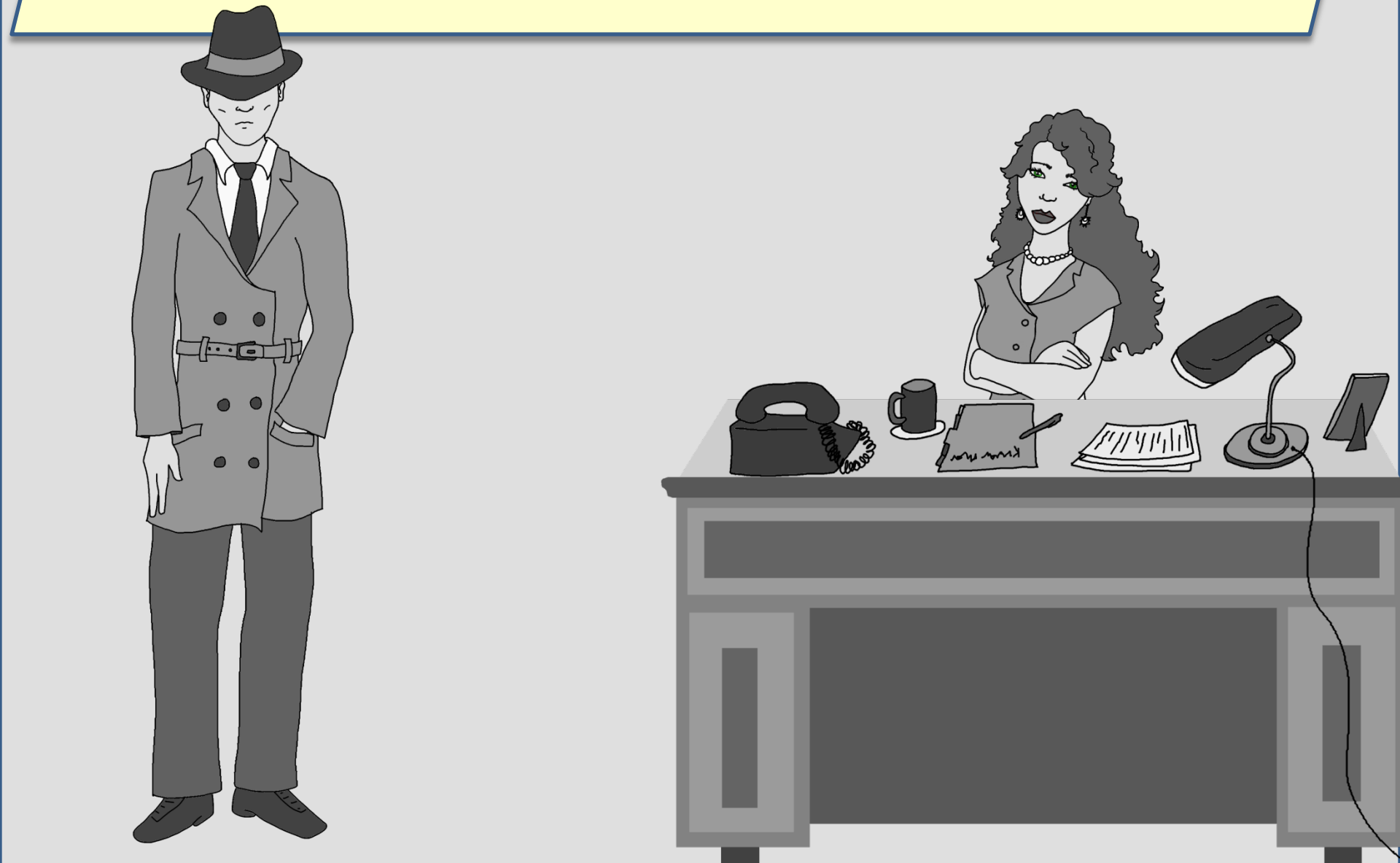
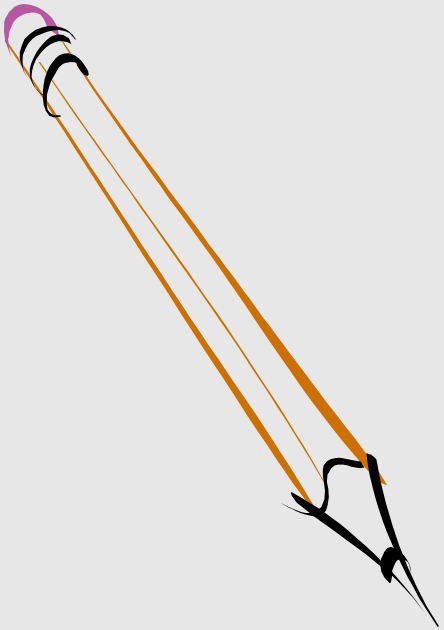
Now get out of here...

This mystery of interactive learning was starting to take shape…

Let's brief the boss on what we know so far…



So what have we learned?

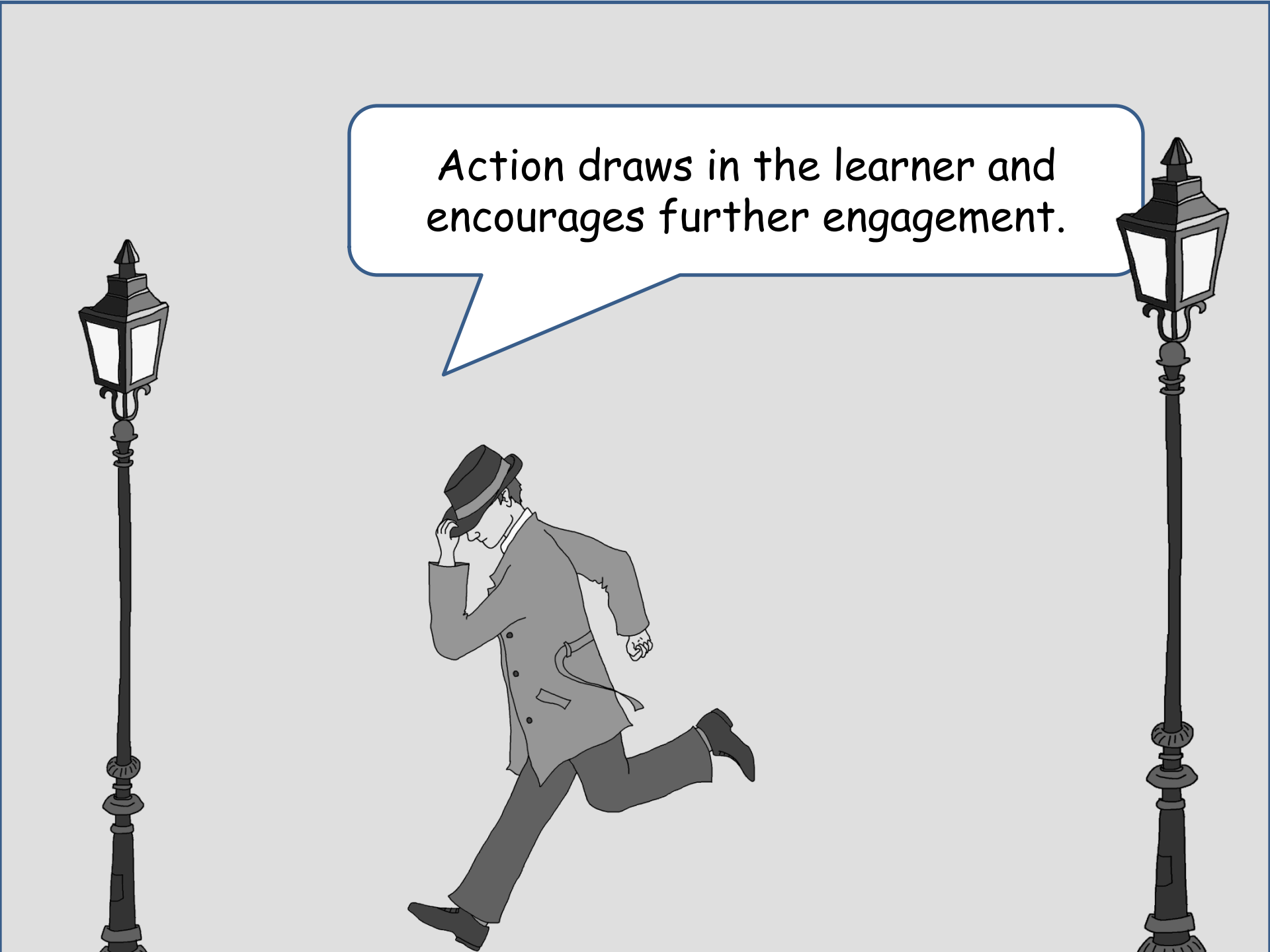


So far, so good. Follow the next clue on the matchbook I found in my desk drawer….


Light's
Camera....
Nite Club


I arrived at the place on the matchbook, as shady as a clump of oaks caught in an eclipse...
KODAKS
NTED
K · KAPP

Hmm… What could this location and clue mean???
Tell me. Does engaging instruction start with…


Action draws in the learner and encourages further engagement.

Make the learner do something

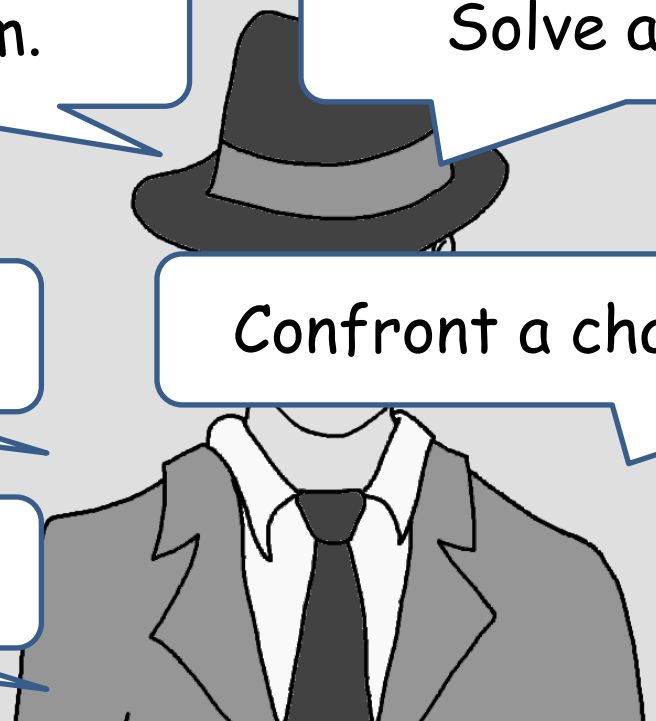
Write a proposal

Identify a procedure.

Answer a question

Solve a Problem.

Solve a mystery.

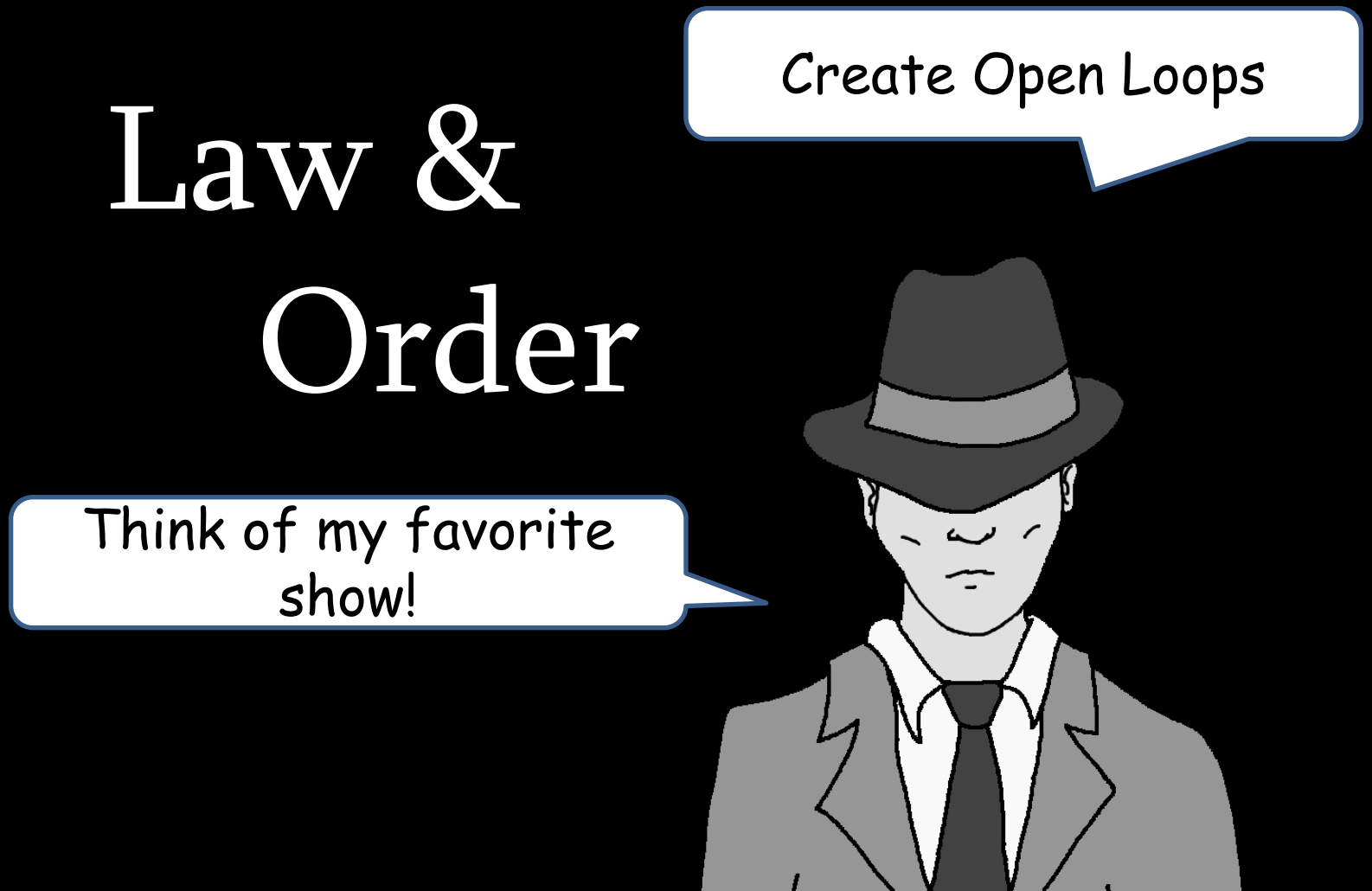


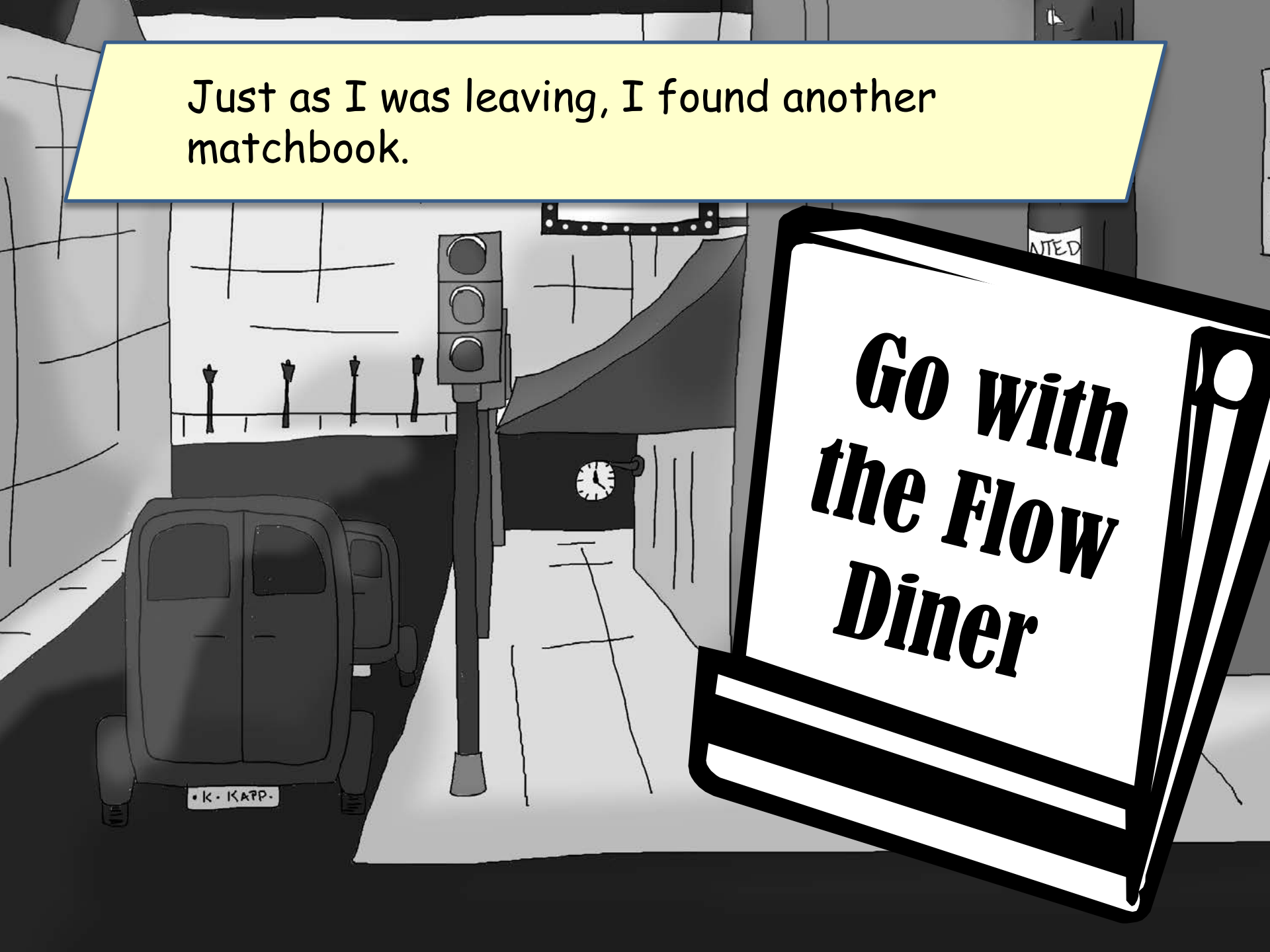
Make a decision.

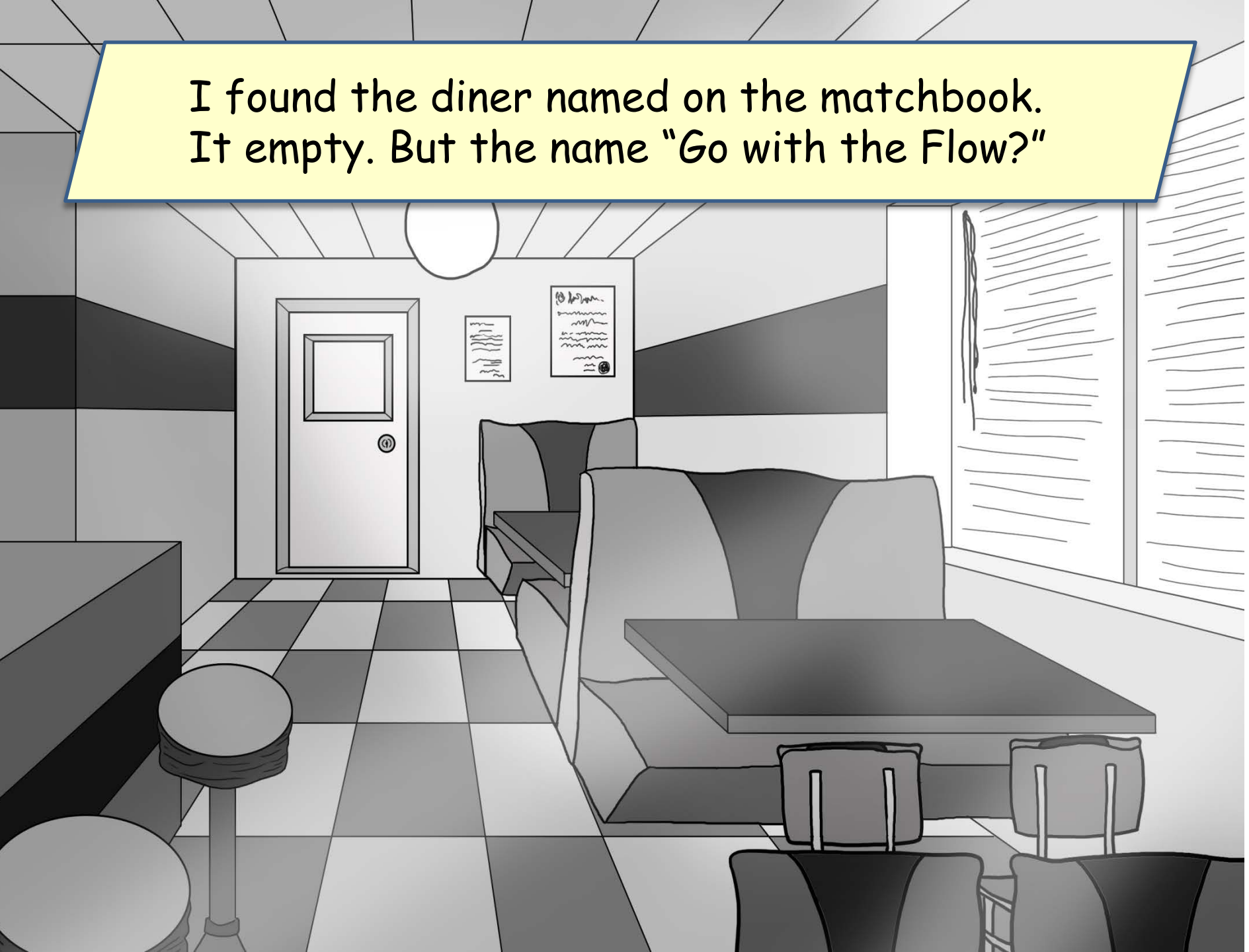
Confront a challenge.

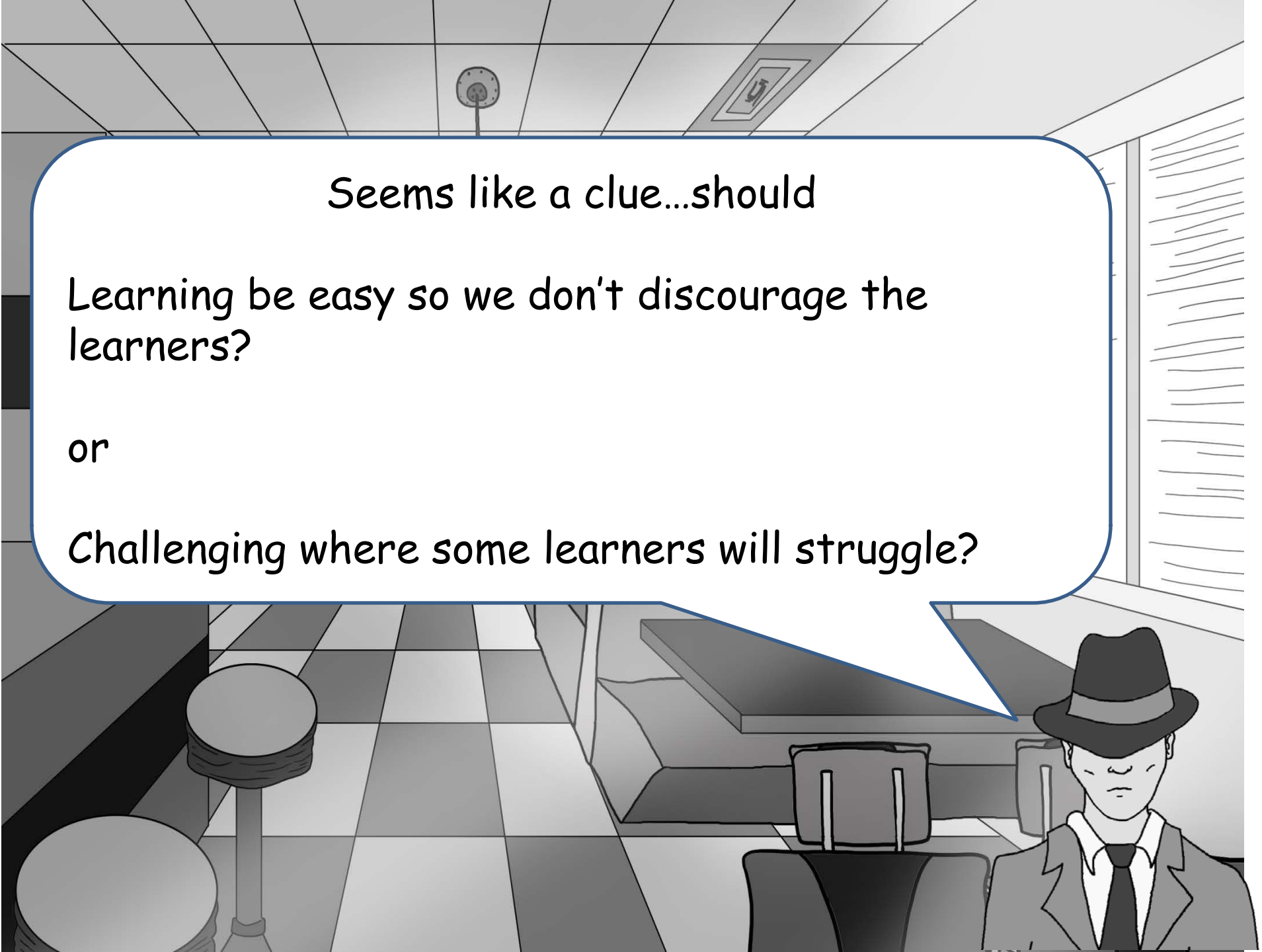
Hands On

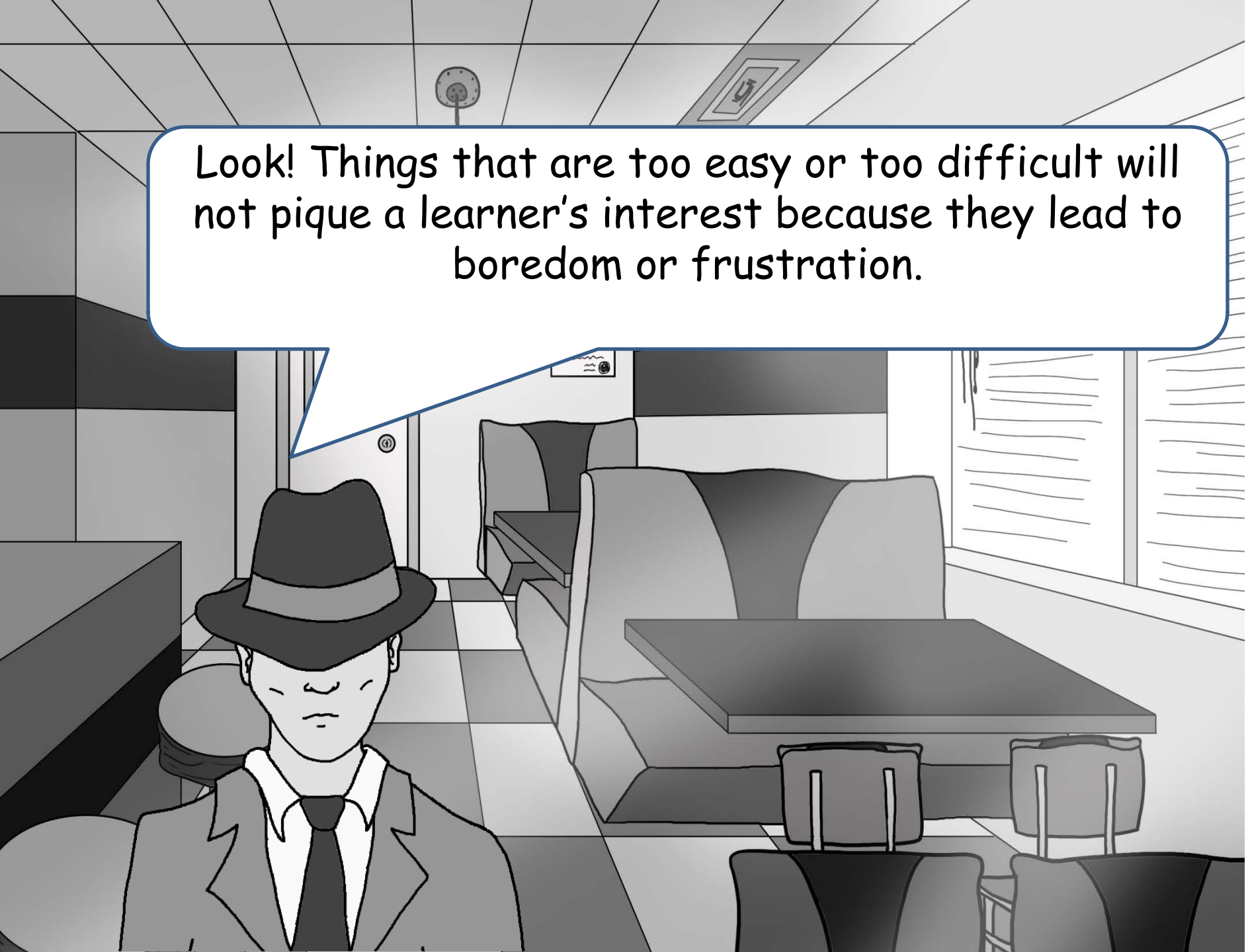
Law & Order



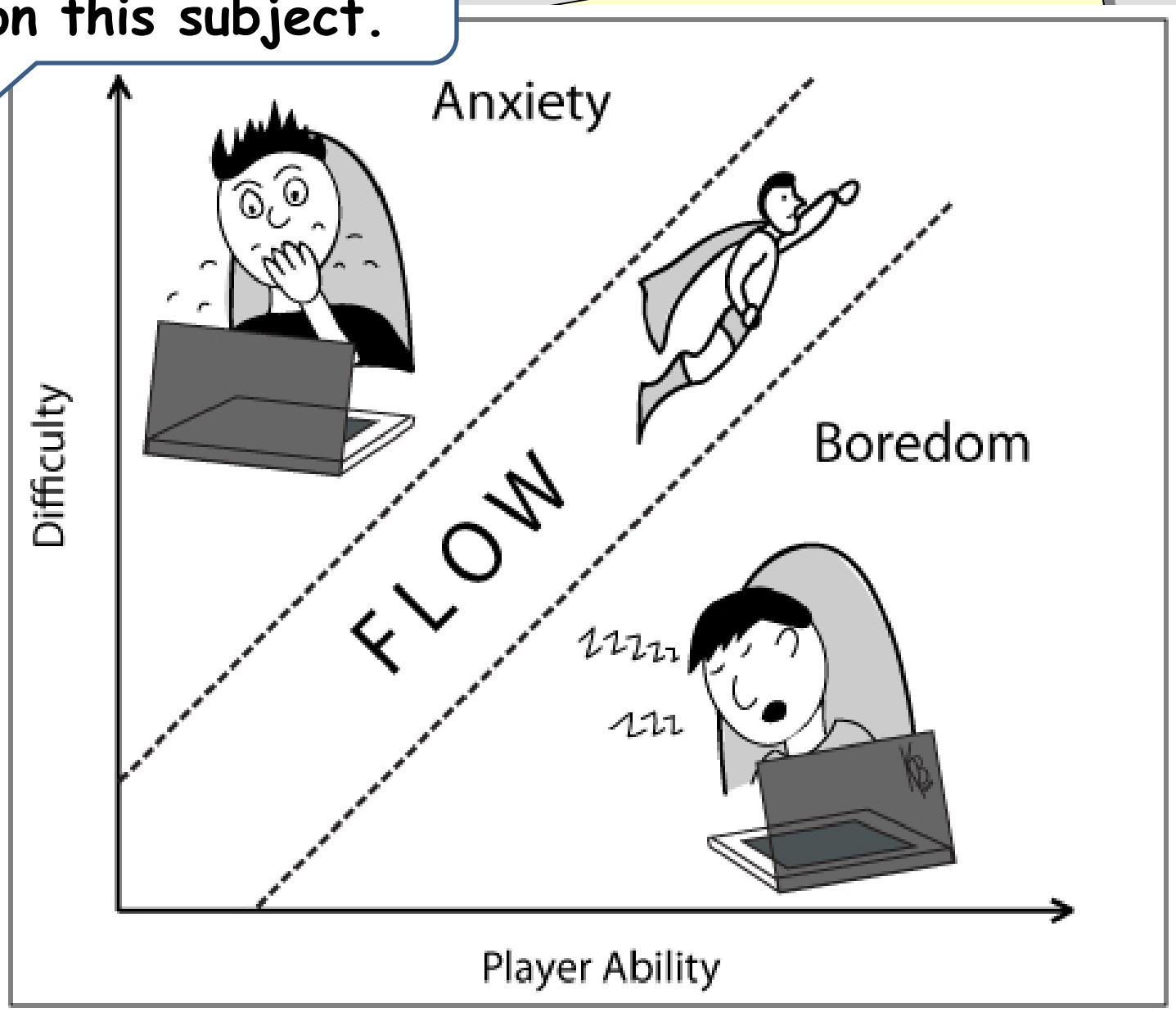

Just as I was leaving, I found another matchbook.
Go With the Flow Diner
K · KAPP


I found the diner named on the matchbook.
It empty. But the name "Go with the Flow?"

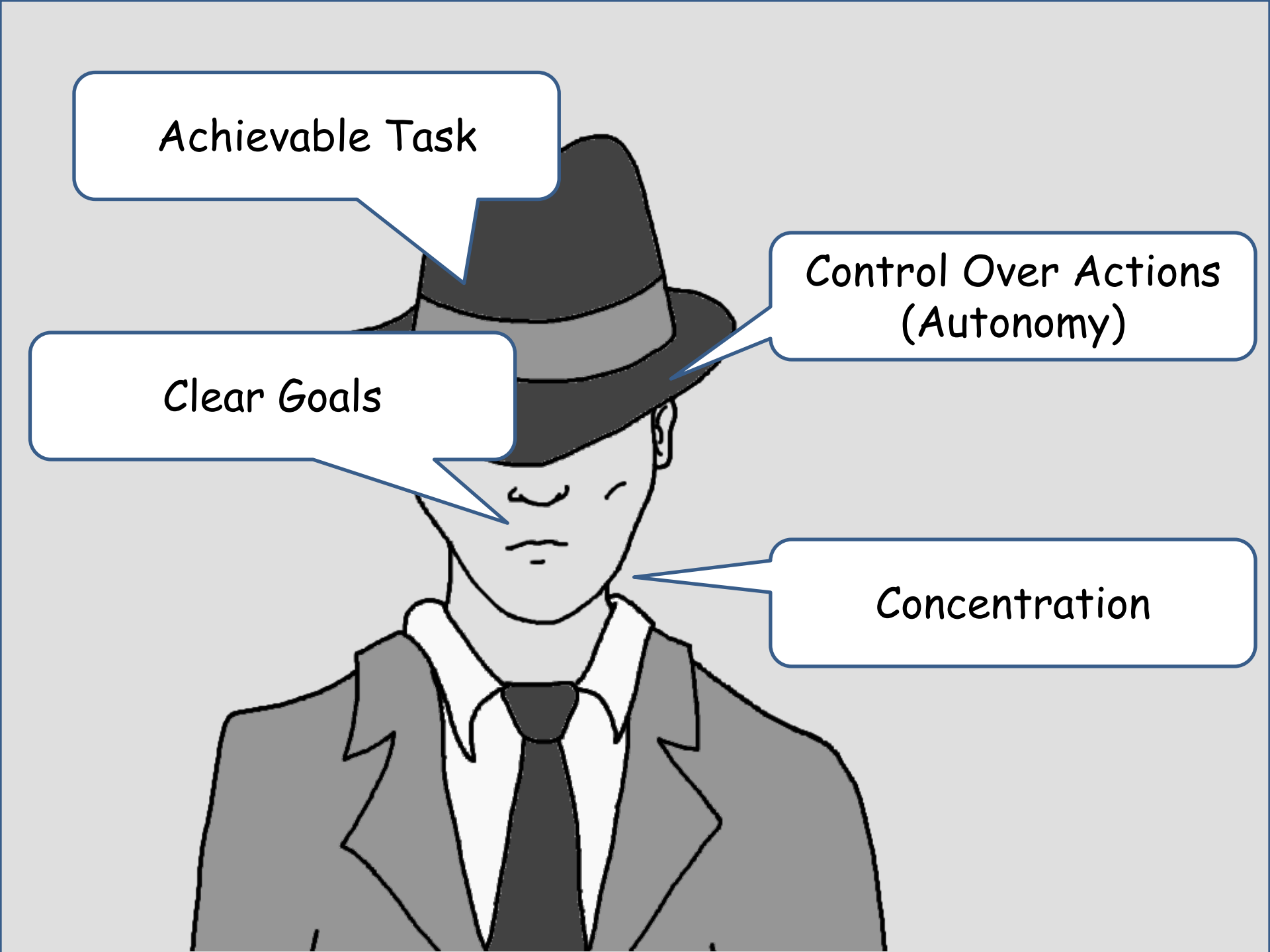

Seems like a clue…should
Learning be easy so we don't discourage the learners?
or
Challenging where some learners will struggle?


Look! Things that are too easy or too difficult will not pique a learner's interest because they lead to boredom or frustration.

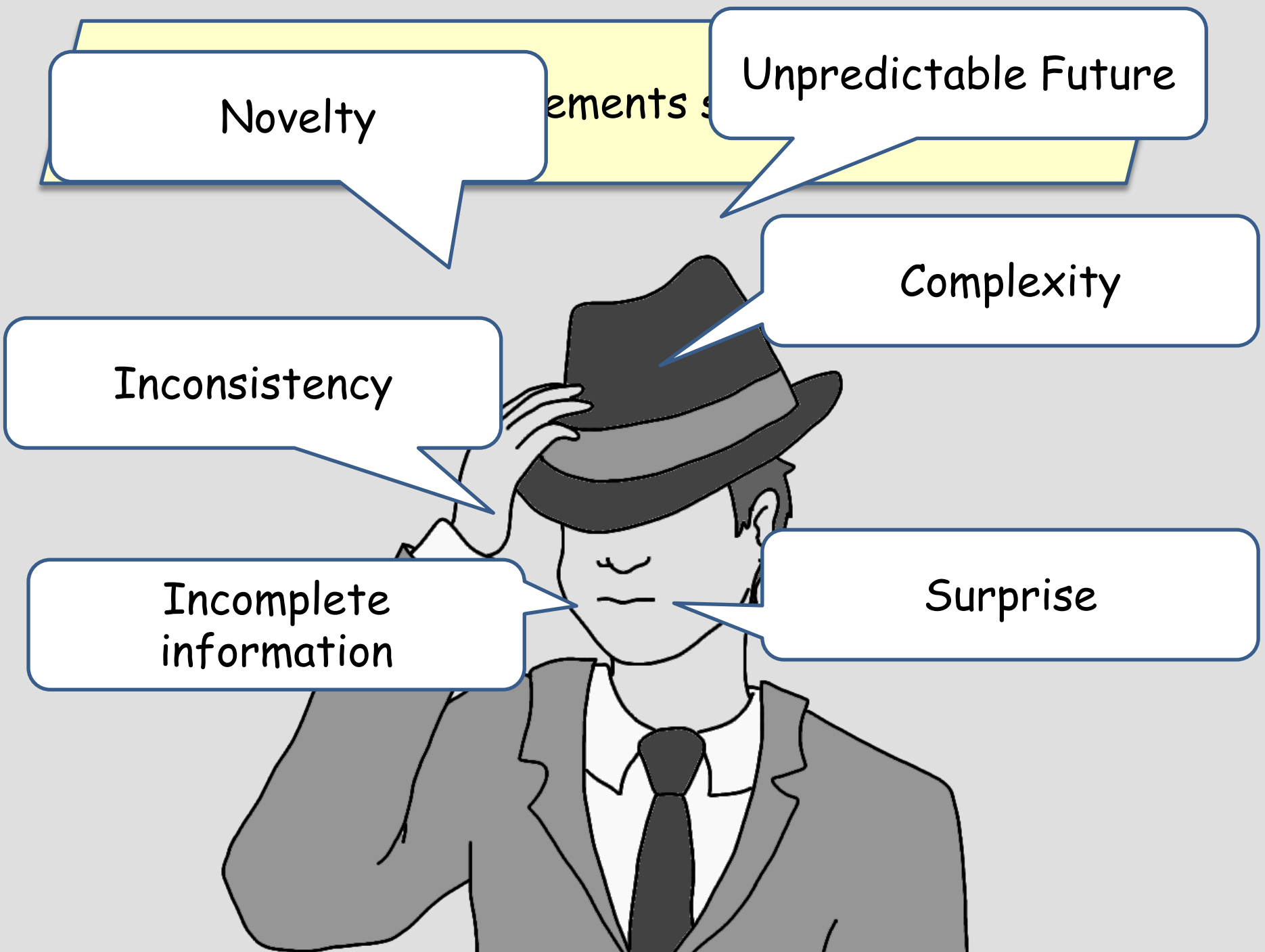
Let me show you Clyde's folder on this subject.



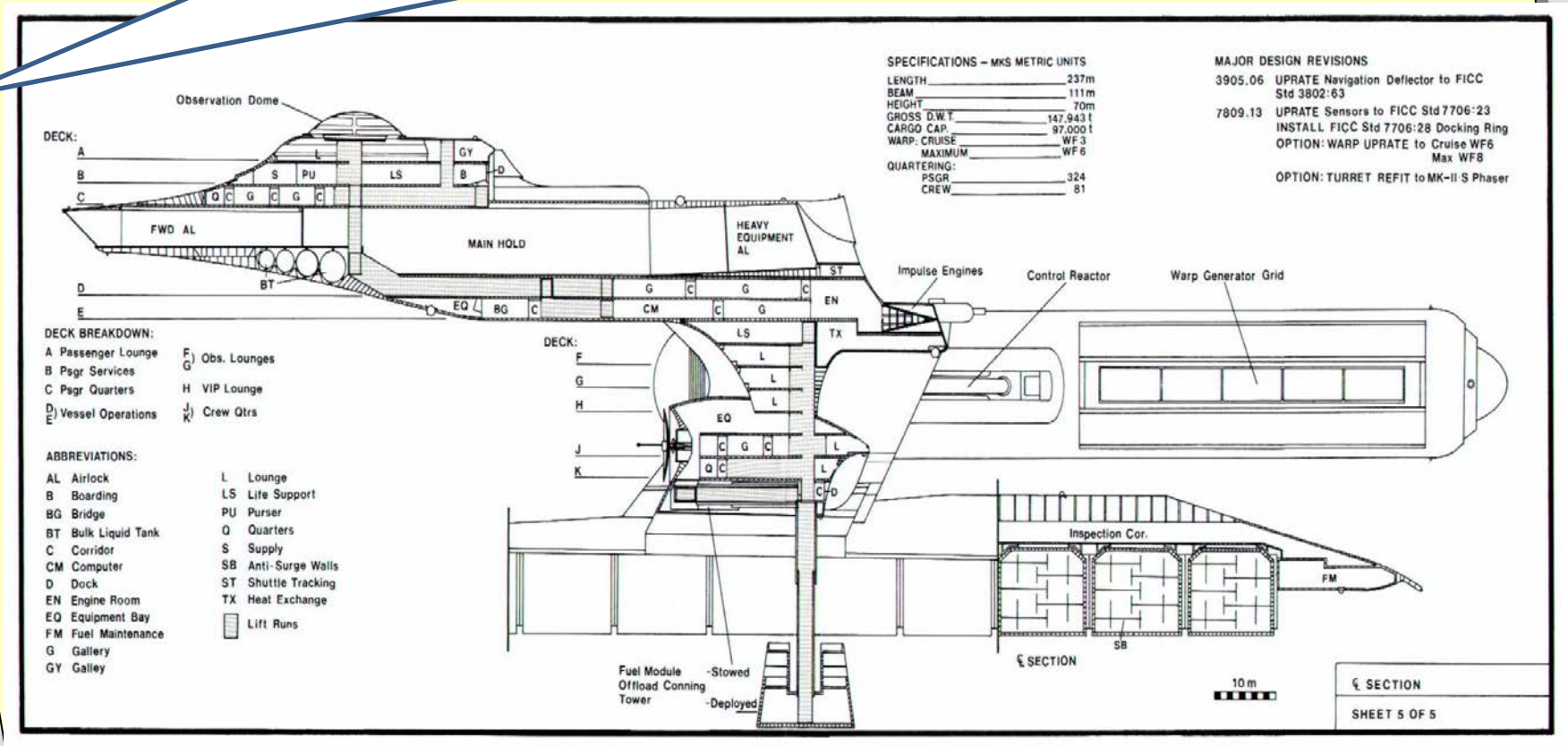
Do you know what elements contribute to flow?

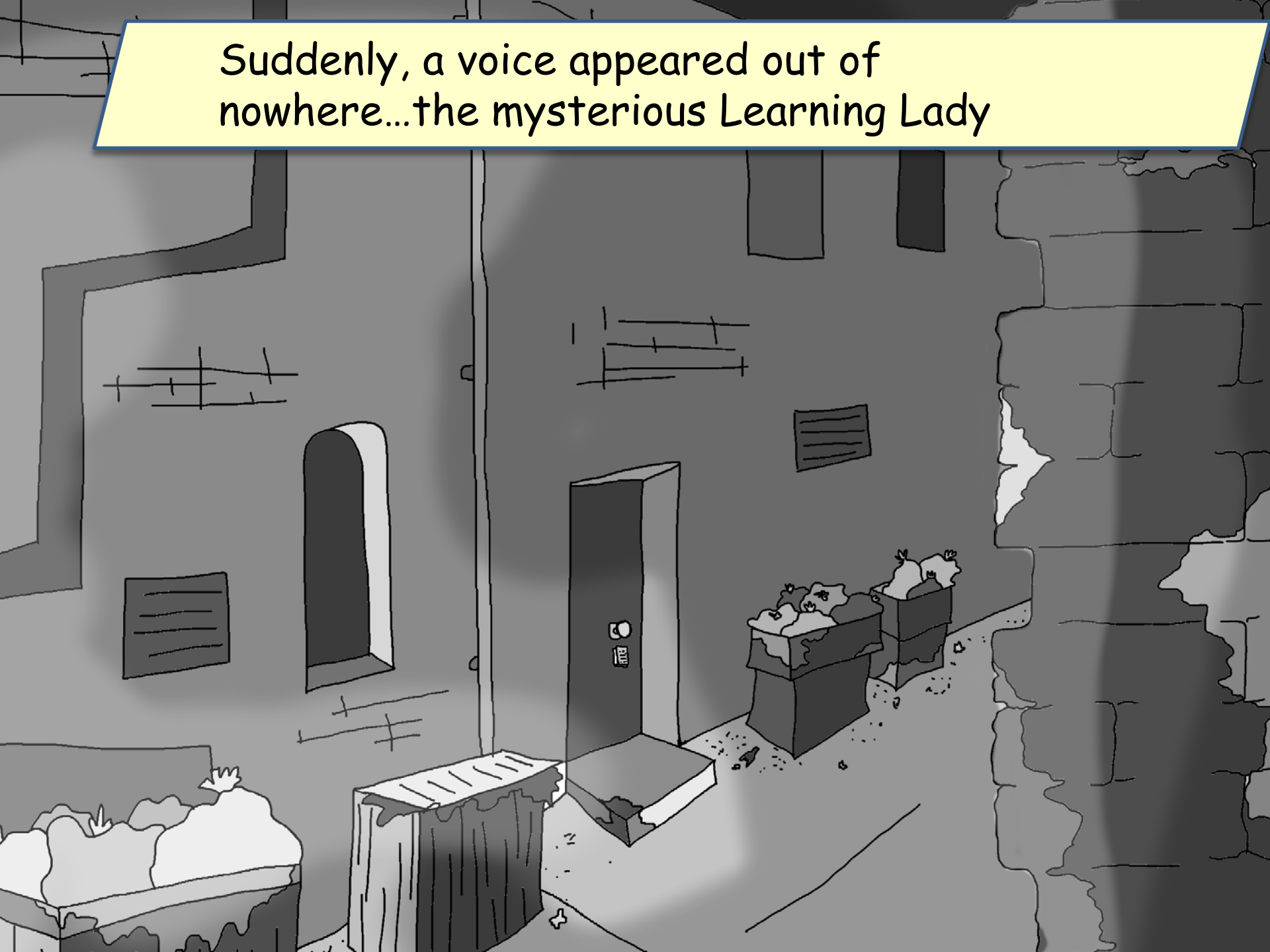

Achievable Task
Control Over Actions (Autonomy)
Clear Goals
Concentration

You can also add elements such as …


ements s
Novelty
Unpredictable Future
Complexity
Inconsistency
Incomplete information
Surprise

In fact, Clyde says…give them the Kobayashi Maru of challenges.



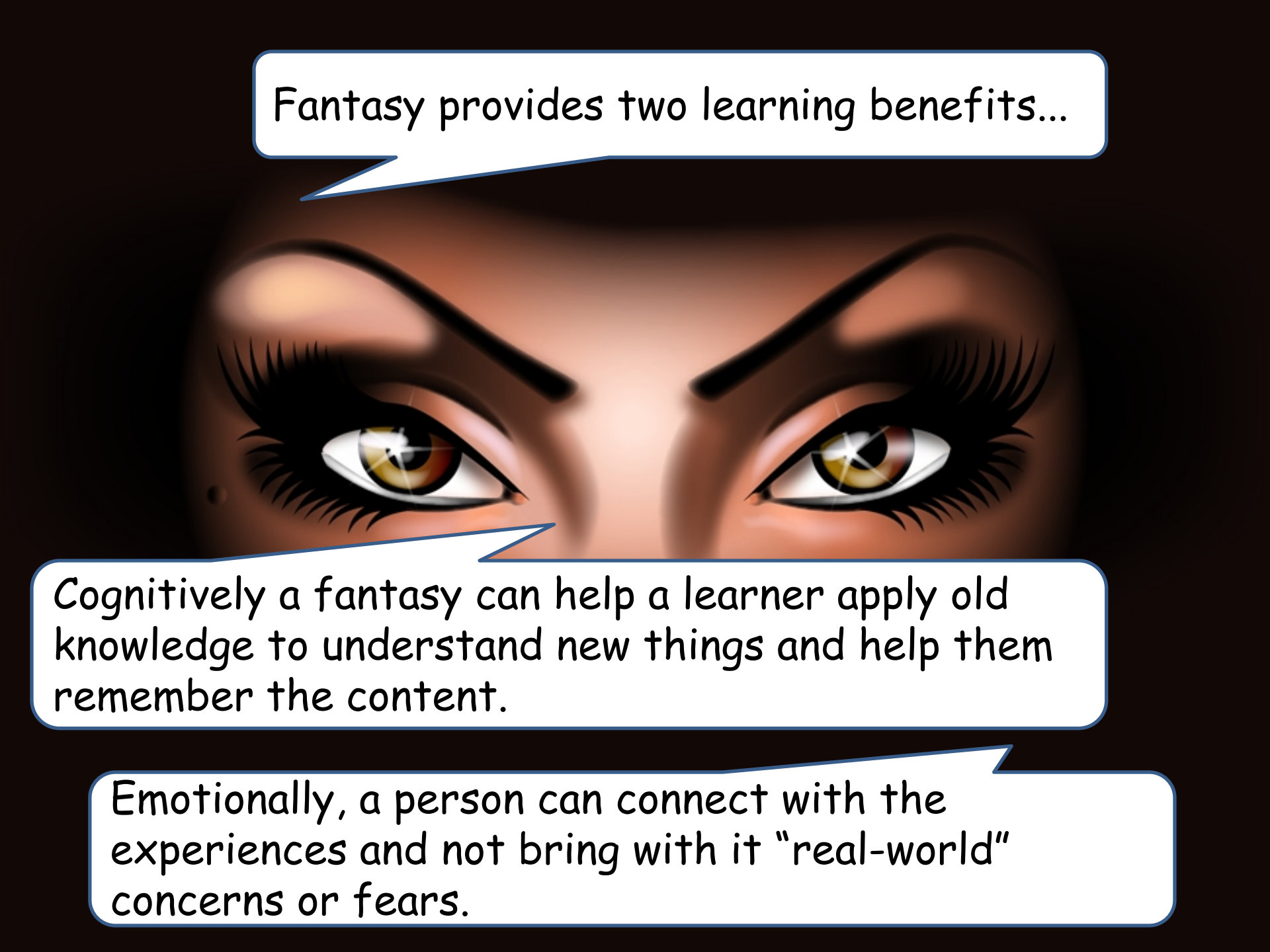

Suddenly, a voice appeared out of nowhere…the mysterious Learning Lady

I saw her eyes in the shadows of the alley and she simply said…

Consider the use of fantasy in constructing learning events….

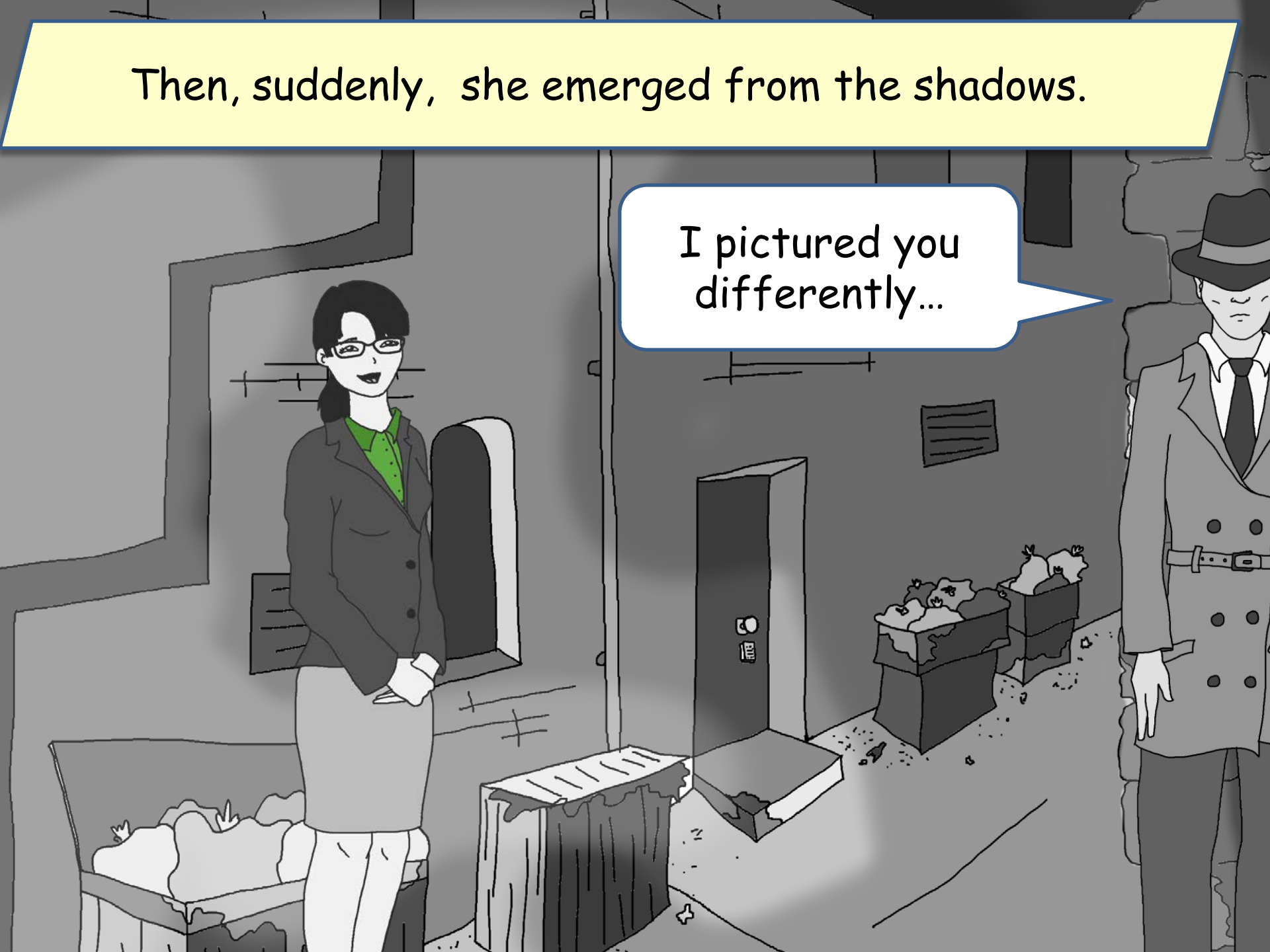

Ya'h sure about this "fantasy" thing? This make believe stuff?

Fantasy provides two learning benefits...

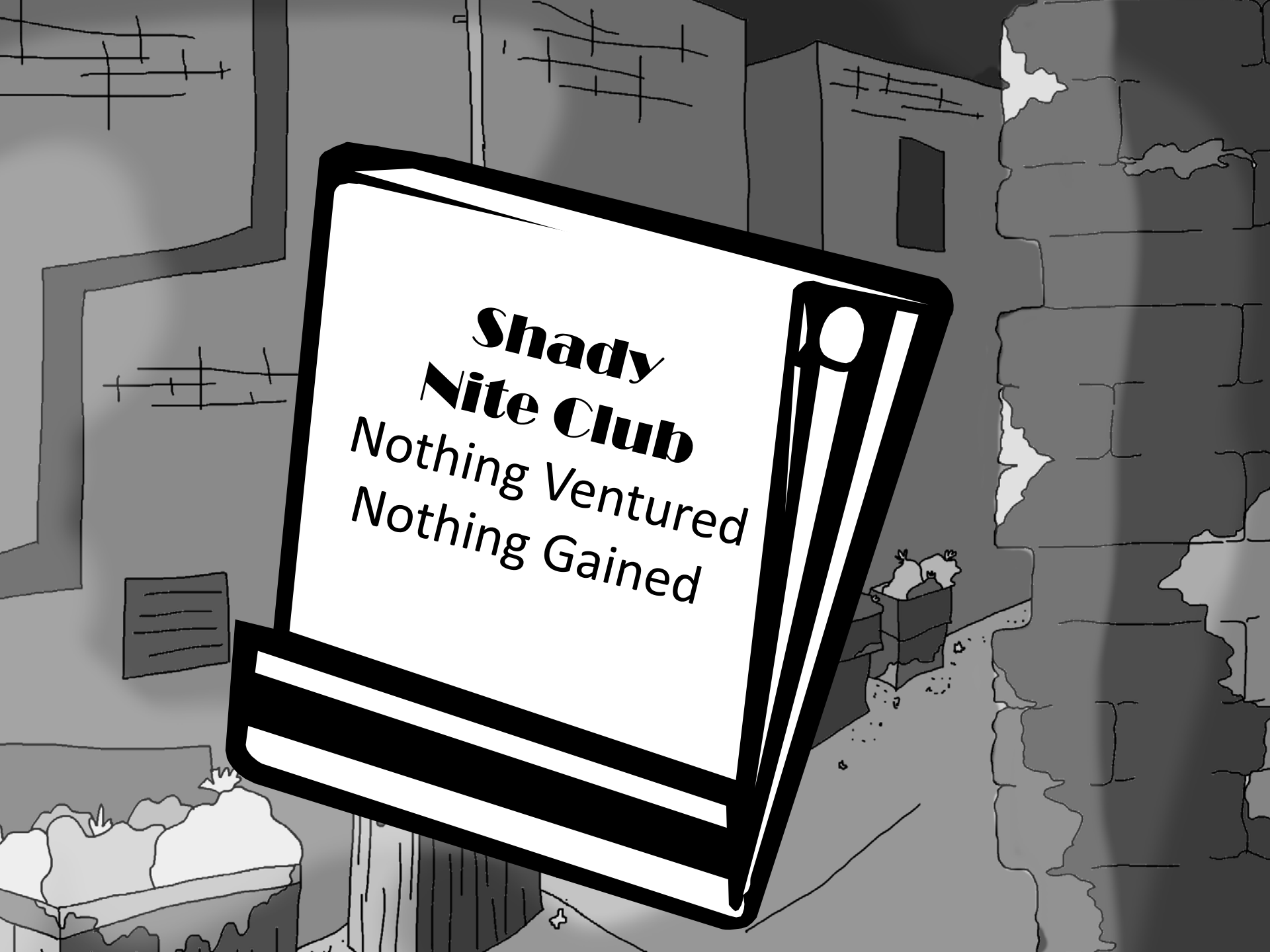


Cognitively a fantasy can help a learner apply old knowledge to understand new things and help them remember the content.

Emotionally, a person can connect with the experiences and not bring with it "real-world" concerns or fears.


Then, suddenly, she emerged from the shadows.
I pictured you differently…


Here are some more matches for your boss. She smokes a lot.
She shouldn't smoke.

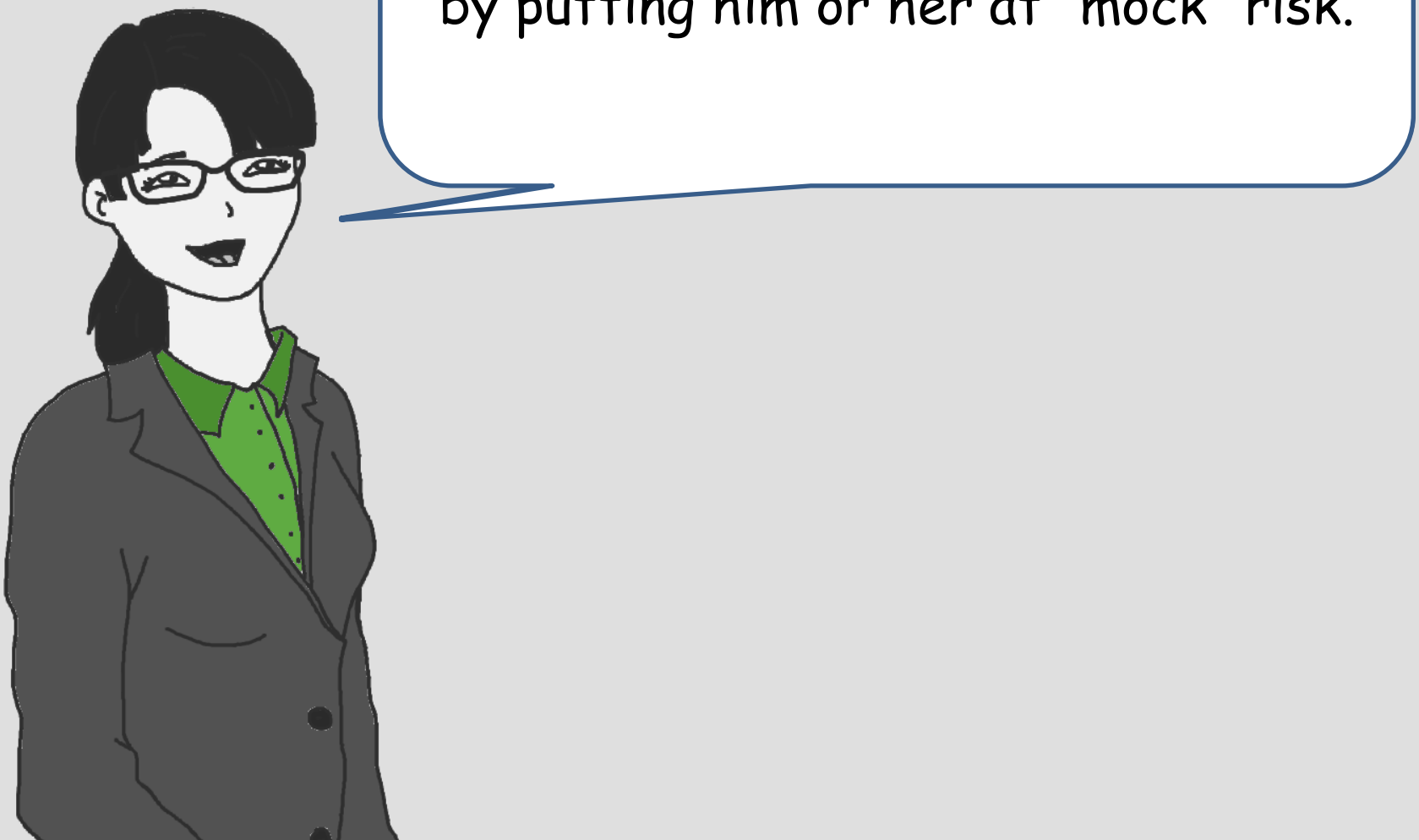

Shady
Nite Club
Nothing Ventured
Nothing Gained

Well, here is the next clue, do we :

Put the learner at risk.

or

Let the learner safely explore the environment.


Get the learner emotionally involved by putting him or her at "mock" risk.

Then they mysterious stranger started talking about what learners can "risk"...

Starting Over

Not Solving the Problem

Losing (points, game)

Social Credibility

Recognition

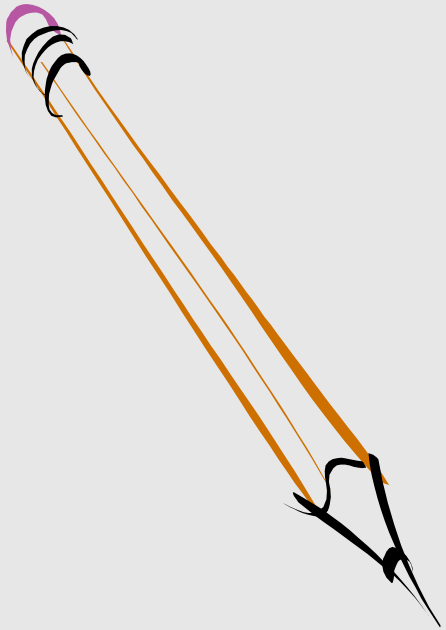
Multiple Lives


In games, failing is allowed, it's acceptable, and it's part of the process.

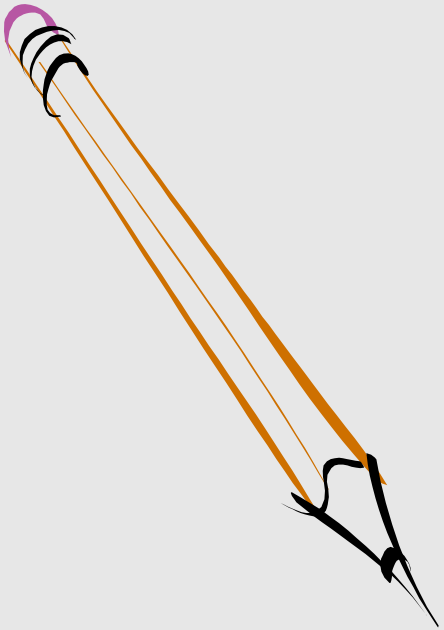
Time for a recap with the boss… she looked a little frazlled…she needed to know one more thing.


What did you detectives learn about gamification?

What are some gamification practices that can engage learners?

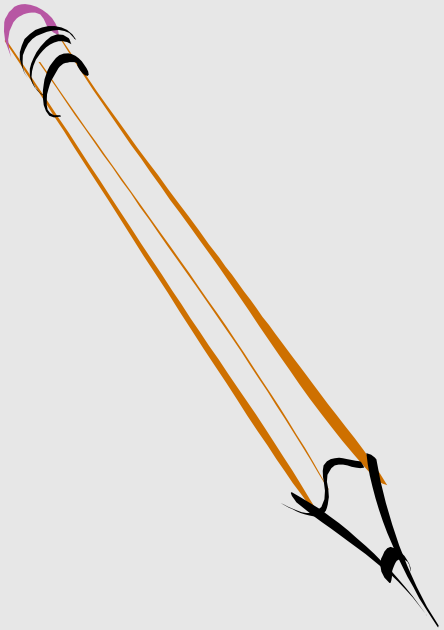


Any Others?



Here's my short list.

1) Story/Characters
2) Polling/Audience Input
3) Points/Winners/Teams
4) Mystery/Curiosity
5) Open Loop



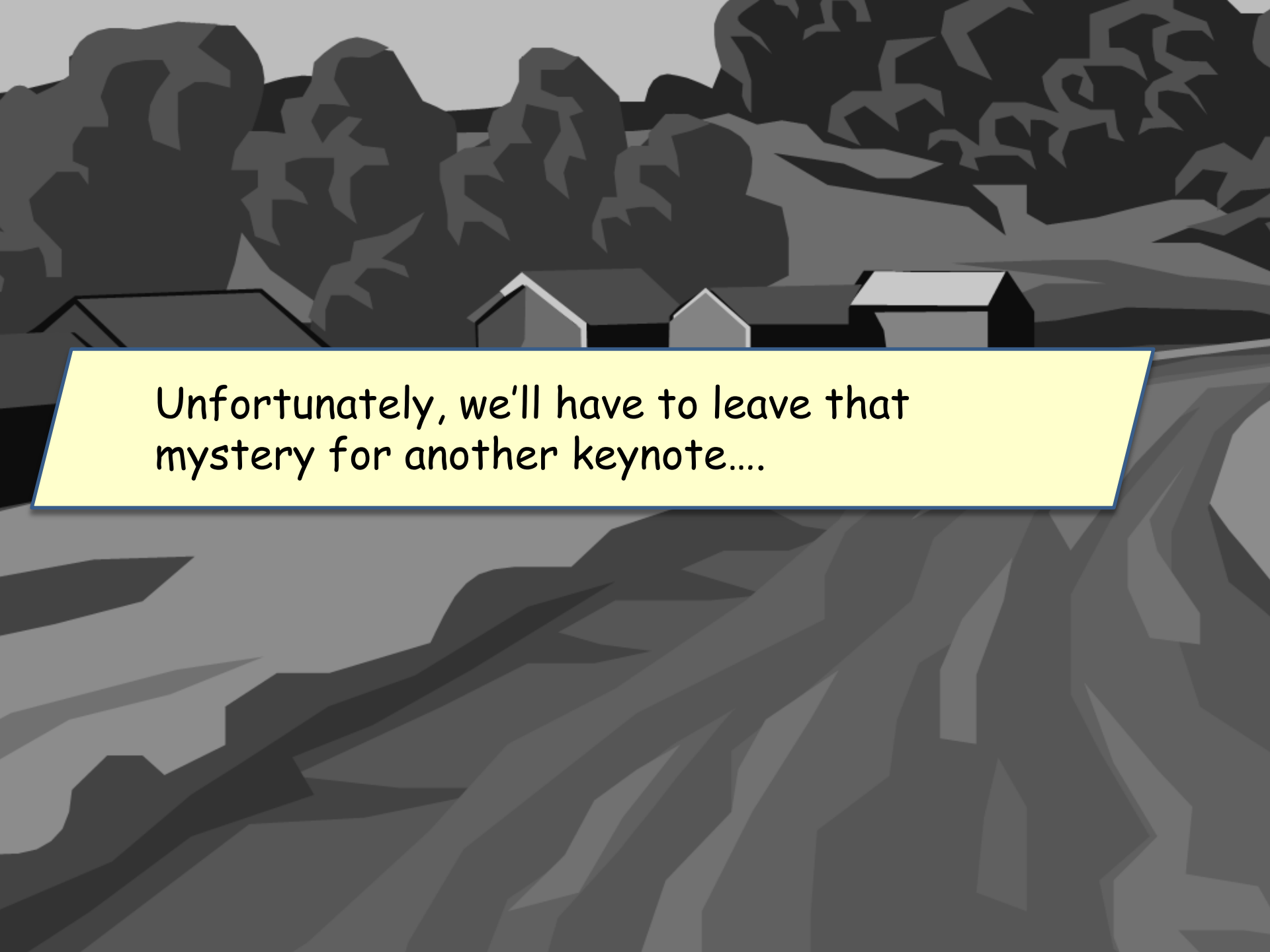
Great stuff, you folks really seemed to have cracked the case as to what makes engaging learning.

So what detective team was the most helpful in solving the mystery? Who were the winners?


There all winners to me.
Ugh


Mystery solved, just in time for the weekend. I was anxious to get some rest…
DR·K·KAPP


But…to my surprise as the Boss was driving away, she threw yet another matchbook….
Meaningful Outcome Café
Start with the End in Mind
DR·K·KAPP


Unfortunately, we'll have to leave that mystery for another keynote….

The End

Credits:

Detective Artwork Courtesy of Vanessa Bailey

Flow Diagram by Kristin Bittner

Typewriter and Mysterious Eyes are Clip Art

Audience Response by Poll Everywhere

Demo of Gamification Software by MindTickle

QUESTIONS?

1

What Is Gamification?

CHAPTER QUESTIONS

At the end of this chapter, you should be able to answer these questions:

- What is a game?
- What is gamification?
- What are three examples of adding game-based elements to traditional learning environments to improve learning and retention?
- What are the advantages of using game-based techniques for the creation and implementation of performance improvement initiatives?

Introduction

You have ten seconds.

Name three countries that begin with the letter "U." Go.

Ten, nine, eight, seven, six, five, four, three, two, one. Hint, check Endnote 1 for answers.[1]

How did you do? Did you get the obvious one? Did you get all three? Did you get more than three? Did you turn to the back of the book? Did answers pop into your head? If you tried to answer the question or looked in the back of the book, you experienced *gamification.*

People like playing games; they are fun and engaging. In fact, a recent survey showed that 55 percent of people would be interested in working for a company that offered games as a way to increase productivity.[2] So maybe your vision of gamification is rewards, badges, and points for doing everyday stuff at work or even for brushing your teeth. But that's a narrow way of looking at gamification; a broader, more encompassing and more helpful way of looking at gamification exists.

Following are several examples of concepts that fit with my definition of gamification. See whether you can develop a definition of the term before one is provided in the text. Or see whether your concept of gamification is the same concept discussed in this book . . . but be prepared, it may not be. Ready, set . . . go.

Gamification in Action

Lack of physical activity is a growing challenge putting millions of people at risk, but it's not due to a lack of information or knowledge. Plenty of people know they should exercise and can recite all the benefits of physical activity when asked. But sadly, this knowledge is not reflected in their behavior. Few people exercise or even elect extra physical activity when given the opportunity. For instance, many people exiting a subway take the escalator to get to street level rather than the stairs, even when the escalator is busy and the stairs empty. But all that changed in one town when they transformed a subway exiting staircase into a set of black and white piano keys,

Figure 1.1. Taking the Stairs and Making Music!

Image reprinted with permission of the artist, Kristin Bittner.

each step producing a different musical note when stepped on, as depicted in Figure 1.1. After the piano-type steps were installed, behavior changed. People started to engage with the keys and elected to take the stairs making music as they entered and exited the subway station. The use of the staircase increased 66 percent.[3]

Running was never a favorite activity of Rachel's; she didn't like to run in the rain or cold, or even if when it was hot or muggy. She couldn't bring herself to jump out of bed in the morning, put on a pair of running shoes, and pound the pavement; she just wasn't that into it. Until she downloaded *Zombies, Run!* The mobile application changed everything.

It wasn't an ordinary application to track running time, number of miles completed, and pacing, Sure, it tracked all that, but it also involved her in an interactive game. As she runs, she plays the role of a character known as Runner 5. Her job is to go out into a zombie-infested post-apocalyptic environment and collect supplies to bring back to her home base.

She puts on her headphones, starts the application and, as she is running, the application periodically indicates when she has collected key items required to support her virtual base. It also warns her when zombie hordes are closing in and she needs to increase her speed. Several times a run, she finds herself chased by zombies and unknowingly doing interval training. All the while, the application records her pace and number of miles; when she returns home, she uploads the information to a website to track her progress. She also tracks the rebuilding of her base using items collects during her run.

Now she can't wait to run. She is actively engaged in the story, and her running miles have increased over the past few months as she finds herself running more so she can rebuild her base faster and find out her next mission as Runner 5.[4]

Sam knows first-hand just how dangerous it can be working on a loading dock. One day, he was unloading product from a delivery truck with his 9,000 pound forklift when he forgot to check behind him as he backed up. What he didn't see was that a co-worker had placed a stack of pallets immediately behind him blocking his right-of-way. As Sam's forklift moved backward, it caught the edge of the pallet and began to tip. Instinctively, Sam tried to jump out of the forklift. Unfortunately, his foot caught, the forklift tipped all the way over on landed on him. He saw himself being killed instantly.

Sam wasn't hurt—not even a scratch. Of course, he did lose one life and 100 life points for his mistake, which made him mad because it dropped his standings in the virtual safety leaderboard. Sam was driving a virtual forklift in a virtual networked simulated environment with an instructor and four other trainees. The entire incident took place online as part of a training activity. After the incident, the instructor used the opportunity to explain to the group several points of forklift and loading dock safety. To this day, Sam has never had a safety incident on an actual loading dock. He contributes that record partly to the training he has received in the loading dock simulator.[5]

Professor Jones, a new faculty member at a large university, teaches large classes. She has over three hundred students per class but, on average, her students have almost 100 percent attendance. Other faculty members marvel at how she is able to accomplish this task because many students use

large classes are an excuse to cut class. But to Professor Jones, the process is simple. Each class period she tracks attendance, demands student interactivity, and evaluates the quality of each and every student's answer to questions she poses during her lectures. Students log onto a website and see their progress against themselves and others on a class leader board. Professor Jones uses an audience response system to make the process for three hundred students manageable.

Every student is assigned a response pad at the beginning of the semester containing his or her student identification number. In every class, Professor Jones poses dozens of questions from the reading interspersed into her lecture. Students respond by clicking a button that corresponds to an answer. The results are instantly loaded to the class website, and students track how they are doing in real time.

Elizabeth's organization is the envy of many. Its members never have to actively recruit; people come to them, drawn by their reputation, and the ones who fit well and make a positive contribution end up being welcomed into the group. Elizabeth has learned from other start-ups the importance of good communication and giving everyone a common vision he or she can believe in. She is a good day-to-day manager but is also careful to step aside and allow others the opportunity to lead. She is charismatic by nature, but uses this strength to make everyone on the team feel like part of something special, rather than hogging the spotlight. When there's a disagreement, everyone on the team knows that she can be counted on to be fair and practical.

She credits her abilities with learning from other leaders. Remembering the first person to promote her into a management position, she says, "This guy was amazing. . . . Everyone loved him. No one could argue with him. And I learned it wasn't just because he was a leader. It was his attitude. He was always open to other ideas, but he also knew how to stick firmly to something he knew would work. It's not about being able to force people to do what you want to them to do; it's about getting people to try what you want and seeing how things work, and staying open to new ideas."

By the time Elizabeth was promoted to her first management position at work, she had years of management and leadership experience from leading one of the most successful guilds on her World of Warcraft server.[6]

Emanuel's factory wasn't doing well. The team members were working as quickly as they could, but they never got ahead of their problems. The plastic inventory components were stacked up around the work centers, customer satisfaction rates were low, and product wasn't flowing through the factory in a timely manner. The only consolation was that none of the competitors' factories looked much better. Emanuel's frustration level was beginning to grow and he could feel himself getting angry; he just didn't know how to improve production. It was at this time that the instructor stepped in and explained to the four teams sitting around the lean manufacturing game boards how they could improve.

The instructor from a lean manufacturing consulting firm demonstrated techniques for streamlining the factory floor layout on the game board and provided ideas for moving materials from work cell to work cell based on upstream demand and not simply meeting a quota. After the demonstration by the instructor, Emanuel and his fellow teammates reconfigured their mock factory and moved their plastic inventory pieces based on the new advice. During this process, something became glaringly obvious to Emanuel. Quickly moving inventory from work center to work center wasn't as productive as only moving inventory when the downstream work center need it. Emanuel had read that advice and heard it spoken by instructors, but he never really understood or trusted that idea until he witnessed the dramatic results during the playing of the game. Four weeks later, the product line Emanuel supervised benefited from his new insight by waiting for downstream demand before producing the needed inventory. Production on Emanuel's line increased by 20 percent, while scrap decreased by 15 percent.

Are these concepts you think of when you hear the term "gamification," or are you still thinking rewards, badges, and points?

What Is a Game?

Before we can go too much further in describing or defining the concept of gamification, we must first define the root of the word gamification. What is a game? There have been many different definitions and attempts at defining

the term "game," but I think one of the closest definitions for application in an instructional setting was put forth by Katie Salen and Eric Zimmerman in their book *Rules of Play: Game Design Fundamentals.*

> "A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome."[7]

Even this excellent definition needs to be modified to fit a learning context, let's replace few words from their original definition and add the concept of emotional reaction based on idea of fun presented by Raph Koster is his seminal work, *A Theory of Fun.*[8]

> "A game is a system in which players engage in an abstract challenge, defined by rules, interactivity, and feedback, that results in a quantifiable outcome often eliciting an emotional reaction."

Let's look at each element of the definition:

- *System*. A set of interconnected elements occur within the "space" of the game. A score is related to behaviors and activities that, in turn, are related to a strategy or movement of pieces. The system aspect is the idea that each part of a game impacts and is integrated with other parts of the game. Scores are linked to actions, and actions are limited by rules.
- *Players*. Games involve a person interacting with game content or with other players. This happens in first-person shooters, board games, and games like Tetris. The person playing the game is the player. Later we'll refer to the players of games as "learners." The act of playing a game often results in learning, and learners are our target audience for gamification of instruction. But, for now, in this context—defining a game—we'll stick with the concept of player.
- *Abstract*. Games typically involve an abstraction of reality and typically take place in a narrowly defined "game space." This means that a game contains elements of a realistic situation or the essence of the situation but is not an exact replica. This is true of the game Monopoly, which mimics some of the essence of real estate

transactions and business dealings, but is not an accurate portrayal of those transactions.

- *Challenge*. Games challenge players to achieve goals and outcomes that are not simple or straightforward. For example, even a simple game like Tic-Tac-Toe is a challenge when you play against another person who has equal knowledge of the game. A game becomes boring when the challenge no longer exists. But even the challenge involved with the card game of Solitaire provides enough challenge that the player continues to try to achieve the winning state within the game.
- *Rules*. The rules of the game define the game. They are the structure that allows the artificial construct to occur. They define the sequence of play, the winning state, and what is "fair" and what is "not fair" within the confines of the game environment.
- *Interactivity*. Games involve interactions. Players interact with one another, with the game system, and with the content presented during the game. Interactivity is a large part of games.
- *Feedback.* A hallmark of games is the feedback they provide to players. Feedback within a game is typically instant, direct, and clear. Players are able to take in the feedback and attempt corrections or changes based on both the positive feedback they receive as well as negative feedback.
- *Quantifiable Outcome*. Games are designed so that the winning state is concrete. The result of a well-designed game is that the player clearly knows when he or she has won or lost. There is no ambiguity. There is a score, level, or winning state (checkmate) that defines a clear outcome. This is one element that distinguishes games from a state of "play," which has no defined end state or quantifiable outcome. This is also one of the traits that make games ideal for instructional settings.
- *Emotional Reaction*. Games typically involve emotion. From the "thrill of victory" to "the agony of defeat," a wide range of emotions

enter into games. The feeling of completing a game in many cases is as exhilarating as is the actual playing of the game. But at times frustration, anger, and sadness can be part of a game as well. Games, more than most human interactions, evoke strong emotions on many levels.

Together these disparate elements combine to make an event that is larger than the individual elements. A **player** gets caught up in playing a game because the instant **feedback** and constant **interaction** are related to the **challenge** of the game, which is defined by the **rules,** which all work within the **system** to provoke an **emotional reaction** and, finally, result in a **quantifiable outcome** within an **abstract** version of a larger system.

What Is Gamification?

All of the examples in the opening of this chapter have one thing in common: they use elements traditionally thought of as game-like or "fun" to promote learning and engagement. The positive outcomes and behavior changes described are the result of the process of "gamification."

Deciding whether to take the stairs or escalator is typically not a decision based on fun, but add keys that make music when you step on them and fun plays a major role. Graphing your runs and challenging yourself and others to reach the next level provides feedback and interactivity not typically available. Learning to be safe is serious business, but placing the person in a safe environment and letting him or her gain experience through trial and error brings an allowable element of failure into the process. Leadership training programs are typically boring, dry, and highly politicized, whereas leading a guild and gaining experience rallying the troops to succeed on a raid is engaging. Playing a board game is usually reserved for family fun night, but when properly configured and used in a corporate setting, insights can be gained that could not otherwise be possible. Motivating over three hundred students in a large lecture class to attend on a regular basis can be a daunting task without the motivation of a leader board.

Game-based techniques or gamification, when employed properly, have the power to engage, inform, and educate. Gabe Zichermann who wrote the book *Game-Based Marketing,* defines the term gamification as the "process of using game thinking and mechanics to engage audiences and solve problems."[9] Amy Jo Kim, author of *Community Building on the Web* and a well-known designer of social games, defined the term gamification as "using game techniques to make activities more engaging and fun."[10] The consultancy firm The Gartner Group defines gamification as "the broad trend of employing game mechanics to non-game environments such as innovation, marketing, training, employee performance, health and social change."[11] Wikipedia defines the concept thus:

> "Gamification is the use of game play mechanics for non-game applications (also known as 'funware'), particularly consumer-oriented web and mobile sites, in order to encourage people to adopt the applications. It also strives to encourage users to engage in desired behaviors in connection with the applications. Gamification works by making technology more engaging, and by encouraging desired behaviors, taking advantage of humans' psychological predisposition to engage in gaming. The technique can encourage people to perform chores that they ordinarily consider boring, such as completing surveys, shopping, or reading websites."[12]

Combining elements from these definitions and getting rid of the emphasis of getting people to do things they ordinarily consider boring, results in defining the term gamification as:

> "Gamification is using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems."

Let's look at each element of the definition:

- *Game-Based*. The concepts outlined in the definition of "game" described above apply to gamification. The goal is to create a system in which learners, players, consumers, and employees engage in an

abstract challenge, defined by rules, interactivity, and feedback that results in a quantifiable outcome ideally eliciting an emotional reaction. The goal is to create a game in which people want to invest brain share, time, and energy.

- *Mechanics.* The mechanics of playing a game include levels, earning badges, point systems, scores, and time constraints. These are the elements that are used in many games. Mechanics alone are insufficient to turn a boring experience into a game-like engaging experience, but they are crucial building blocks used during the gamification process.
- *Aesthetics*. Without engaging graphics or a well-designed experienced, gamification cannot be successful. The user interface or the look and feel of an experience is an essential element in the process of gamification. How an experience is aesthetically perceived by a person greatly influences his or her willingness to accept gamification.
- *Game Thinking*. This is perhaps the most important element of gamification. It is the idea of thinking about an everyday experience like jogging or running and converting it into an activity that has elements of competition, cooperation, exploration and storytelling.[13] It is how running becomes a social process. Friends compete against each other while simultaneously offering encouragement in a cooperative environment and the runner tells the story of running one thousand miles or of escaping zombies. It is how the management of a virtual factory provides the insights into the operations of a real factory. It's how leadership skills are learned guiding others on quests.
- *Engage*. An explicit goal of the gamification process is to gain a person's attention and to involve him or her in the process you have created. Engagement of an individual is a primary focus of gamification.
- *People*. These can be learners, consumers, or players. These are the individuals who will be engaged in the created process and who will be motivated to take action.

- *Motivate Action*. Motivation is a process that energizes and gives direction, purpose or meaning to behavior and actions. For individuals to be motivated, the challenge must not be too hard or too simple. Driving participation in an action or activity is a core element in gamification.
- *Promote Learning*. Gamification can be used to promote learning because many of the elements of gamification are based on educational psychology and are techniques that designers of instruction, teachers, and professors have been using for years. Items such as assigning points to activities, presenting corrective feedback, and encouraging collaboration on projects have been the staples of many educational practitioners. The difference is that gamification provides another layer of interest and a new way weaving together those elements into an engaging game space that both motivates and educates learners.
- *Solve Problems*. Gamification has a high potential to help solve problems. The cooperative nature of games can focus more than one individual on solving a problem. The competitive nature of games encourages many to do their best to accomplish the goal of winning.

What Gamification Is Not

Now that we have defined the term gamification, let's define what gamification is not. There are a number of commonly held misconceptions about gamification that must be addressed so that the true potential of gamification can be realized. Gamification is not . . .

- *Badges, Points, and Rewards*. Unfortunately, the least exciting and least useful elements of games have been labeled "gamification." This is unfortunate because the real power of game-based thinking is in the other elements of games: engagement, storytelling, visualization of characters, and problem solving. Those are the foundations upon which gamification needs to be built. Unfortunately,

a few people are devaluing the term "gamification" when it could have real use in describing how to take engagement and learning to the next level. Learning professionals, who have been adding "real" game elements to learning, such as interactivity, storytelling, and problem solving, need to take back the word "gamification" and use it for themselves.

- *Trivialization of Learning*. Gamification is not a cheapening or dilution of "real learning." Serious learning scenarios are undertaken within game spaces all the time from military games, to sales incentives, to practicing medical procedures or preparing for standardized tests. Gamified learning can, and is, difficult, challenging, and stressful. Well-designed games help learners acquire skills, knowledge, and abilities in short, concentrated periods of time with high retention rates and effective recall. Do not think of games for learning in the same way as you think of games for children. Gamification is a serious approach to accelerating the experience curve of the learning, teaching complex subjects, and systems thinking.
- *New*. In spite of the rapid growth of the concept of gamification, the elements of gamification are not new. The military has been using "war games," simulations, and goal-driven experiences to train personnel for centuries. In fact, many historians believe that a 7th century game called Chaturanga may be the first game that used pieces to serve as military figures on a fictional battlefield. The pieces represented foot soldiers, elephants, and chariots, which moved about on a playing board much like the modern chessboard.[14]

  Teachers, faculty members, and corporate trainers have been using game-like techniques for a long time as well. Instructors, trainers, and professors embed stories in the form of case studies to wrap experiences for learners, create challenges to engage learners, and set goals and provide feedback on progress while providing a safe environment for learners to practice skills. All of these are elements of gamification.

What is new is the emphasis of bringing all of these elements together in an engaging manner under the single concept of gamification. The focus on the relationships and dependencies of these elements is new. The rapidly growing acceptance of game thinking and game mechanics applied to performance, learning, and instruction is forcing a re-examination of how games impact learning and performance.

- *Foreign to Learning Professionals*. It is critical to remember that learning and development professionals are uniquely qualified to lead the gamification effort within organizations. The elements of interactive design that are buried in good instructional design strategies need to be surfaced and applied to the creation of online and face-to-face learning events to create compelling interactive experiences while leveraging the best from game-based experiences.
- *Perfect for Every Learning Situation*. There are many situations for which gamification will not work. Too often the learning profession embraces a new concept as the answer to all learning problems and overhypes the concept to the point of backlash. It is important to approach the gamification of content and learning carefully and methodically. If gamification is seen as a panacea and applied to every single learning event, it will quickly become trivialized and non-impactful. Stay focused on using gamification for the right learning outcomes.
- *Easy to Create*. Creating an effective game or properly gamifying content is not an insignificant task. It takes a great deal of design and up-front work to determine which game elements should map to which types of content and what incentives and rewards work with what type of environment. It also takes time to develop the right theme, the correct method of scoring, and the best way to determine the winning states. In short, it is not easy to create a game that is both fun to play and instructional.
- *Only Game Mechanics*. Bolting one or two game elements onto boring content is not an effective use of gamification. A huge mistake

made by novice designers or others who attempt to embrace gamification is that they only look at the mechanics of the game such as scores, points, rewards, badges, and so forth, and neglect other, more critical, elements of effective gamification. The best approach is to consider the entire experience of the learner and not just one or two elements. Storytelling comes into play, as do the motivational aspects of the learning. The entire experience must work together. If a piece or part is missing and the environment is not congruent with the learning, the results can be disastrous. It is the interplay of different elements all adding up to more than the sum of the parts that makes an experience worthwhile.

Gamification Versus Serious Games

To some the difference between the terms "serious games" and "gamification" is simple. A serious game is an experience designed using game mechanics and game thinking to educate individuals in a specific content domain. There are serious games for leadership, sale techniques, and other business topics as well as many serious games in the realm of healthcare. These folks approach the serious game as a noble use of game mechanics and a way to engage and interact with learners.

On the other hand, they view the concept of "gamification" as a trivial use of game mechanics to artificially engage learners and others in activities in which they would otherwise not engage. They see the addition of points, rewards, and badges to activities as trivial and not a serious use of the "essence" of games or game-based learning. To them, gamification is leaderboards and high scores artificially tacked onto real-life situations.

As indicated above, these are not the traits of gamification as defined in this book. In fact, the definition of "gamification" as merely adding game mechanics to non-game situations to encourage engagement is a narrow approach; an approach that does not lead to learning, engagement, or productivity improvements.

Gamification as defined here is *a careful and considered application of game thinking to solving problems and encouraging learning using all the elements of*

games that are appropriate. When you get right down to it, the goals of both are relatively the same. Serious games and gamification are both trying to solve a problem, motivate people, and promote learning using game-based thinking and techniques.

Serious games tend to take the approach of using a game within a well-defined game space like a game board or within a computer browser, while gamification tends to take the use of a game outside of a defined space and apply the concept to items like walking up steps, tracking the number of miles run, or making a sales call. But even these are artificial distinctions.

When an instructional designer develops a game to teach the sales process within an organization, is that the gamification of sales techniques or is it a serious game? Is asking students to answer questions about physics using an audience response system to obtain a certain grade a serious game with serious consequences (like passing or failing) or simply gamification of a serious subject? Is the process of tracking all the food you eat and the steps you take with sensors prior to having heart surgery a serious game or the gamification of pre-surgical preparation? Is a game designed to teach you how to exercise and run after the surgery a serious game or the gamification of a recovery plan? An argument might be that the musical stairs example in the beginning of the chapter was an example of play but not an example of gamification because there was no goal to accomplish and, therefore, the example is of play and not gamification.

Looking at it another way, the musical stairs example cited earlier doesn't have an artificial goal or objective from the players' perspective like a serious game. The people using the stairs want to get to the top (intrinsic motivation) and the music adds a little extrinsic motivation and engagement or interactivity (game mechanics) to the process. However, the designers of the musical steps did have a very specific goal . . . get people to use the stairs. And is getting to the top of the stairs a goal?

People using reward points (an oft-noted gamification technique) have an intrinsic goal (fly to a beach for vacation). The slight extrinsic motivation is that they might be able to fly for free or reduced price if they acquire enough points. The goal of the designers of the reward system is to persuade

the people to fly more on their airline. The completion criteria is taking the flight for free.

Employees playing a game teaching better sales negotiation skills have an intrinsic goal to become better salespeople, and the "game environment" is extrinsic motivation with an artificial goal (defeat the anti-sales aliens, for example). The sales folks could learn sales skills without the "serious game." But management really wants them to sell more by taking to heart the "gamified" learning content.

So each activity has an intrinsic goal (reach top of steps, fly for free, learn to sell better), each has extrinsic elements (music, points,) each has a clear end point (top of stairs, a free flight, sales game ends), and each is designed specifically to illicit a serious outcome (taking stairs for health, sell more airline tickets, sell more product.) Is only the airline rewards example "gamification"? I don't think so. I think all are examples of gamification.

Is something only a "game" if the people engaged in the activity have a goal? If a designer involves people in a game without their awareness—like the step example–is that a game? Stated another way, if a designer has a clear goal for the desired outcome and the players aren't aware of it, is it still a game? Is adding game elements (points, time constraints, leaderboards) to traditional instructional content (learning how to be a better salesperson) the "gamification" of content?

For the purpose of this book, the delivery of content—for a purpose other than pure entertainment—using game-based thinking and mechanics is gamification. Placing artificial goals on items like taking the stairs is a game—the goal is to get to the top of the steps but to be engaged in the process. In this book, the creation of a serious game falls under the process of gamification. So, yes, climbing the musical stairs, earning frequent flyer miles, and teaching sales skills with a game are all gamification because all of these processes fit under the definition of using game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems. Building a game based on content to be learned is really the gamification of the content; the same thought processes, techniques, and approach needs to be applied as when one is gamifying a website or a set of stairs.

In this book, the use of serious games will be considered a form of gamification because serious games are a specific sub-set of the meta-concept of gamification. Gamification encompasses the idea of adding game elements, game thinking, and game mechanics to learning content. The goal of gamification is to take content that is typically presented as a lecture or an e-learning course and add game-based elements (story, challenge, feedback, rewards, etc.) and create a gamified learning opportunity either in the form of a full-fledged educational game, in the form of game-elements on top of normal tasks like running for exercise, or in the form of an engaging classroom experience wherein the learners participate in a story-based challenge to master the content presented.

The core underlying element of gamification is game play and that is why the chapters in this book study games and game elements. Understanding how games work and influence learners will help professionals understand how to create future learning experiences that are engaging, motivational, and lead to increased retention and application of knowledge.

Growth of Gamification

The gamification trend is growing, with no signs of slowing down. Elements from games are making their way into corporate training departments through avatars, increased problem-based learning, and interactive learning experiences. Colleges and universities through audience response systems, online simulations and interactive storytelling are quickly integrating game-thinking into the curriculum. The influence of games and game elements is growing at a rapid pace.

One of the reasons for this growth is that the average video game player has been playing games for over twelve years and more and more people at all ages are playing games. In fact, 26 percent of people playing games are over fifty, which is an increase from a mere 9 percent in 1999.[15] Video games are main stream and becoming more popular yearly.

In the United States, computer and video game software sales generate over $10.5 billion a year and 67 percent of American households play computer or video games. Additionally, nearly sixty-two million U.S. Internet

users, or 27 percent of the online audience, will play at least one game on a social network monthly making social gaming a billion dollar a year business.[16] With online and social games growing at a rapid pace. The massively multiplayer online role play game (MMORPG) industry, with well-known games like World of Warcraft, RuneScape, Disney Toontown, Club Penguin, and Eve Online, itself is valued at over $4 billion. [17]

But these numbers are dwarfed by the world wide video and computer game industry, which is valued at over $105 billion.[18] With the United Kingdom spending $270 million and France spending $220 million just on MMORPGs games. In Japan, spending on game consoles and handheld devices is approximately $2.2 billion per year.

As the proliferation of video and computer games increases, the gamification industry itself is growing at a staggering rate. More than 50 percent of organizations that manage innovation process will gamify those processes within the next decade.[19] Also within the decade, the overall market for gamification is predicted grow to $1.6 billion, up from a reported $100 million in 2011.[20] Within the next five years, a gamified service for consumer goods marketing and customer retention will become as important as Facebook, Twitter, or Amazon, and more than 70 percent of Global 2000 organizations will have at least one gamified application.[21]

Who Is Using Gamificaiton?

A number of organizations are using gamification to train workers, educate students, solve problems, and generate new ideas and concepts. These organizations range from business schools to software companies to pharmaceutical companies to government organizations, and beyond. In almost every industry it is possible to find an example of the gamification of learning, innovation, and problem solving.

Cisco developed a game it calls “The Binary Game,” which is an arcade game that looks like Tetris. The idea is to teach people the basic idea of binary numbers. The player doesn’t need to know binary numbers to play but actually learns the concept while playing. Within five minutes, the game exposes the players to the forty to fifty binary problems. Quickly, the players

recognize patterns and develop strategies because they are trying to beat the game. Those patterns and strategies are actually giving them ability to think in binary.[22]

IBM created an interactive first-person thinker game called INNOV8, which teaches the complex idea of business process management by making players responsible for making decisions that impact the fictitious company named After, Inc. The game, is used in business and information technology programs in hundreds of schools around the world. The interactive, 3-D educational game was designed to bridge the gap in understanding between IT teams and business leaders in an organization.

In the game, students make business decisions based on materials within the game, collaboration with classmates, and in game discussions with characters that provide various amounts of information. Skills learned include business problem solving, prioritization, and consensus building. The game provides a type of virtual internship that allows students to examine the ramifications of their decisions in a safe environment where they won't really get fired or lose a bonus based on a bad decision.[23] It is a gamified approach to teaching decision making and business acumen.

Of course, the military has always been a huge advocate of games and has gamified military strategy, war preparedness, and tactical training. Military organizations worldwide have found that, when dealing with life and death, game-based training scenarios make an impact on the learners.

But a new wrinkle in military gamification is the use of games to solve military problems. In this case, the U.S. military is trying to generate new ideas on how to battle Somali pirates through the use of a massive multiplayer game. The initiative involves the military creating a game-based environment and crowdsourcing military problems to civilians. The goal is to find innovative solutions by observing what players do within the game environment.

The game platform is called a massive multiplayer online war game leveraging the Internet (MMOWGLI) and will have more than one thousand online players who will immerse themselves in the game environment focused on defeating the efforts of Somali pirates. This unique use of

gamification is the first time the American military has integrated crowdsourcing and gamification into traditional military war games.

The game, created by the Office of Naval Research (ONR), is designed to test the feasibility of using massively multiplayer online games to solve difficult and non-conventional strategic problems. The first integration of the game focuses on combating Somalia piracy but the platform is designed so it can be adapted to a variety of military situations. The goal is to see whether the game will help the military gain insights into fighting off piracy in the Horn of Africa and Gulf of Aden. Players negotiate the logistics of arming ships, determine the likelihood of pirate attacks, and carefully consider the financial, jurisdictional, and temporal difficulties of military action needed to support commercial shipping and cruise ships. Then they set sail and face pirate attacks; they will then see whether they successfully prepared.

If unsuccessful, players make adjustments and try again. All the while, the military will track what happens, hoping that the scaled-up participant pool offers novel combinations of actions and ideas that, ultimately, assist with solving the real-life problem.[24]

The United Kingdom's Department for Work and Pensions created a game called Idea Street. The goal behind the game was to decentralize innovation and generate ideas from its 120,000 people across the organization. Idea Street is a social collaboration platform with the addition of game mechanics. The mechanics included points, leader boards, and a "buzz index." Within the first eighteen months, Idea Street had approximately 4,500 users and had generated 1,400 ideas, sixty-three of which had gone forward to implementation.[25]

In the area of innovation and idea generation, Hilton's Embassy Suites used game techniques in a customer loyalty campaign targeting 50,000 of Embassy Suites' most loyal guests. The company solicited participation with ten different approaches, including direct mail, e-mail, and asking customers to play a game. The game option proved most effective. The people targeted by the game (five thousand) were most likely to open e-mails and later spent the most money. That group accounted for about $200,000 of the additional $1 million in revenue generated by the campaign.[26]

Implications and Importance to the Future of Learning

Learning professionals must understand the growing trend of applying game-based sensibilities to the development of instruction through creating time-based activities, leveling up of learning experiences, storytelling, avatars, and other techniques. Yes, points and leaderboards will be a part of that, but they are not the main focus; all elements of games need to be brought to bear intelligently and carefully.

The growing use of avatars, the increasing popularity of massively multiplayer online role play games, and the addition of point systems, badges, and leaderboards in realms such as economics, retail sales, and finance are leading to a proliferation of gamified collaborative and learning techniques. This is not a waning trend; rather it is gaining momentum and acceptance in more and more fields. Learning and development professionals must follow that trend or be left behind. This is especially true when applied to areas not typically thought of as material appropriate for "games."

This is also crucial because traditional methods of learning are losing favor, most page-turning e-learning modules are boring people who have grown up playing video games for an average of twelve years. Time and attention of learners is limited, and learning professionals must focus on providing an engaging and goal-oriented solution to the training and teaching dilemma. A focus on gamification increases engagement, relevance, and immersion and assists with the transfer of learning to the actual situation.

Learning professionals will be called upon to match different game strategies with different types of learning content to create the right learning outcome. College faculty, learning professionals, and others in the field of learning and education must gain knowledge of how gamification techniques can be used in a variety of settings to improve learning, retention, and application of knowledge. Learning and development professionals and educators are in a unique position to seize the opportunity to create interactive experiences for internal employees, students, and customers using gamification.

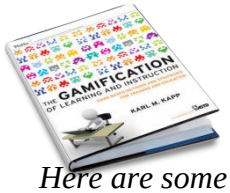
In the next chapter, we'll examine the individual elements that contribute to making a game engaging. Knowledge of these elements will assist with the gamification of content to be learned.

■ ■ ■

Key Takeaways

The key takeaways from this chapter are

- A "game" is a system in which players engage in an abstract challenge, defined by rules, interactivity, and feedback, that results in a quantifiable outcome often eliciting an emotional reaction.
- "Gamification" is using game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems.
- Gamification is not the superficial addition of points, rewards, and badges to learning experiences.
- Gamification is growing; soon a gamified service for consumer goods marketing and customer retention will become as important as Facebook, Twitter, or Amazon.
- Global 2000 organizations are quickly putting gamification into place.
- Gamification techniques can be applied to learning applications within any type of industry, from the military to retail to computer services to manufacturing organizations.
- Serious games are created by using game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems. In other words, they are created through the gamification of traditional learning content.
- Learning professionals, educators, and faculty members have many of the skills, knowledge, and abilities to take a leadership position in the gamification of learning and instruction.



Gamification Resources

Here are some resources to learn more about Gamification as a competitive advantage for learning and stakeholder engagement..

Books

The Gamification of Learning and Instruction: Game-based Methods and Strategies for Training and Education by Karl M. Kapp.

The Gamification of Learning and Instruction Fieldbook: Ideas into Practice. by Karl M. Kapp, Lucas Blair and Rich Mesch.

The Gamification Revolution: How Leaders Leverage Game Mechanics to Crush the Competition. by Gabe Zichermann and Joselin Linder

Pick up these books at a specialized online bookstore: http://astore.amazon.com/wwwkarlkappco-20

Blog: Kapp Notes: http://karlkapp.com/kapp-notes/

Twitter: **(**Please follow me for updates, ideas and links about gamification): @kkapp

LinkedIn: www.linkedin.com/in/karlkapp/

Video Resources

What is Gamification? A Few Ideas. http://youtu.be/BqyvUvxOx0M

TEDx Talk (Life Lessons from Video Games) http://youtu.be/dq5mh8-zP4g

Audience Response Software

Polleverywhere http://www.polleverywhere.com/ (used for presentation)

Turning Technologies http://www.turningtechnologies.com/ (similar software)

Selected Articles

10 Best Practices for Implementing Gamification by Karl Kapp http://tinyurl.com/oyzmlsa

8 Game Elements to Make Learning More Intriguing by Karl Kapp http://tinyurl.com/p6hraky

B	I	N	G	O
Yes or No Games and gamification are the same thing.	How many types of gamification are there? _____	The use of fantasy in a learning event provides how many learning benefits? _____	Yes or No Learners remember facts better when presented in a bulleted list or when presented in a story?	Engaging learning starts with ____ Action Or Objectives
Yes or No Games must be "fun" to foster learning	Yes or No Learning should be easy so you don't discourage learners.	True or False Testing yourself is a better way to learn than re-reading or re-listening to material.	True or False Clear goals contribute to flow.	___ Average age of a game player in the United States
True or False Gamification uses parts of games but is not a game itself.	__% increase that can be achieved just by having a character, rather than plain text, provide feedback to learner	True or False **Structural Gamification** is use of game-elements to propel a learner through content with no alteration or changes to the content.	____is the ideal time between spaced rehearsal events	True or False Put the learner at risk.