

Using Fable-Based Storytelling as a Pedagogical Tool in Assessment Exams

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Abstract

A fable is a story, often fictitious, that uses narrative to weave an illustrative medium from which new knowledge may be comprehended. Frequently, some moral or ethical lesson is couched within the fable. Fable-based learning, folklore-based learning, and narrative pedagogy are terms used to represent the use of storytelling for learning. These learning tools build on narrative theory via our understanding of the role of metaphor and metaphorical reasoning in the learning process. Narrative theory postulates that humans are natural storytellers and interpret the world through narrative. Academic examples of fable-based learning abound in mathematics, science, business, psychology, and computer information systems. Outcomes of this teaching tool may include overcoming resistance to learning, increased learning, enjoyment, openness to new beliefs and perspectives, and increased learner engagement. We find that the application of fable-based learning is currently limited to teaching and lecturing. We propose extending fable-based learning and storytelling to the assessment phase of pedagogy. The assessment phase is a knowledge-verification process where learning is measured through exams or assignments. We explore how storytelling can be used in the design of assessment exams and give an example of a multiple-choice exam that uses fable-based learning principles in a Management of Information Systems course. We propose that fable and storytelling in assessment exams have the potential to reduce test anxiety, increase enjoyment, increase cognitive fluidity, and increase perceived realism or relevance of the learning objectives. We invite other researchers to explore this domain.

Keywords: assessment exam, fable-based storytelling, management information systems

1. INTRODUCTION

In the Chinese folkloric tale of the *Romance of the Three Kingdoms*, three heroes attempt to overcome the oppressive ruling government by recruiting Chinese soldiers from local villages. The three heroes disagree regarding how many soldiers to recruit from each village, as each village has soldiers of differing strengths, costs, and availability. A celestial, wise man gives the three heroes a magical tablet to help solve the problem given the constraints. Through the use of storytelling and metaphoric device such as the

aforementioned fable, the story introduces the learner to a case where discrete mathematics can be understood as a solution to what is a resource maximization problem. This method of teaching is called folklore- or fable-based learning. This fable is used in a three-course series of MOOCs by Dr. Peter James Stuckey and Dr. Jimmy Ho Man Lee regarding modeling for discrete optimization (<https://www.coursera.org/learn/basic-modeling>). We found the disarming nature of the fable a compelling and worthy educational tool worthy of investigation.

A fable is a fictitious short story with a moral or learning objective and may involve heroes, animals, or legends. *The Grasshopper and the Ant* is a classic Aesop's fable that teaches the value of steady, hard work to prepare for lean times. Given a near-universal appeal, it is little wonder that teaching via fable storytelling has been adapted to the academic environment. Examples from multiple disciplines follow.

Storytelling has been utilized as a pedagogical tool in business, management, math, and information systems (IS). Austin, Nolan, and O'Donnell (2016) use fable-based storytelling in *The Adventures of an IT Leader*. The protagonist, CIO Jim Barton, faces problems running the company's IT department, such as managing technology needs, security, relationships with vendors, and employees. The storytelling format makes the book enjoyable to read, particularly for non-IS business students who may be uninformed about or fearful of technology yet required to take an IS course in a college of business.

Dr. Eliyahu Goldratt (2016) wrote a fictitious novel called *The Goal: A process of Ongoing Improvement* that has been used in some Operations Management courses. The storyline is of a manufacturing plant manager who overcomes a series of problems to improve the output of his plant. Through the story, the reader experiences production problems and their associated pains, observes the thought processes of the protagonist, and observes the results of the application of the Theory of Constraints to resolve the given production problems. Whereas the learning objective of the book is to educate the reader regarding the Theory of Constraints, Dr. Goldratt chose a novel instead of a text-book format as, in his opinion, the complexity of the content is more understandable, relatable, and applicable when conveyed in a narrative (2016). As readers, we too found that *The Goal* was a very enjoyable way to learn principles of operations management from Dr. Goldratt and we have used his book when teaching Operations Management courses. Thus, our curiosity regarding the disarming nature of narrative, storytelling, and fables was piqued.

Pan et al. (2006) use another famous Chinese's folklore called the *Monkey King*. They use the storyline with a multimedia learning system to motivate students to learn about visualizing fourth dimensional mathematical objectives. They report that the folklore helps increase motivation to learn and helps with the visualization of complex mathematical objects.

Our paper extends prior research in fable-based learning by asking the research question of how can fable-based storytelling be used in the assessment phase of pedagogy.

2. LITERATURE REVIEW

Assessment is processes of determining of whether learners have achieved the instructor's desired learning goals by measuring their learning outcomes. An academic learning process starts with an instructor forming specific learning objectives, determining the mode of delivery and content, fostering a learning environment (e.g., delivering a lecture, reading assignment, case study, hands-on activity, service learning, etc.), and assessing the attainment of learning via assessment tools (e.g., exams, assignments, etc.). Finally, the instructor reflects on the learning and improves the process. Angelo (1999) argues that quality assessments foster continuous improvement and results in a higher-quality learning environment for the student.

Multiple choice exams are arguably the most popular assessment tool in academia (Xu, Kauer, & Tupy, 2016). Yet, these exams have several notable limitations. Students prefer free response exams over multiple choice exams as a more accurate reflection of their abilities (Newble, Baxter, & Elmslie, 1979). According to Brassil and Couch (2019), multiple choice responses provide limited insight into the degree to which students believe the answer options. Further, the rote mode of learning such that a student can carefully read the answer, and select the correct answer, even without retaining the knowledge, misses the point of assessment by providing a false positive. Multiple choice exams may only assess lower-cognitive recall rather than measure the higher-order thought intrinsic to the nuances of problem solving in homework assignments or essays or projects.

Narrative Theory

Pedagogy is a process designed to foster new beliefs or new knowledge within the student. According to Narrative theory, humans are natural storytellers who understand and interpret experience as ongoing narratives (Fisher, 1984). Narrative theory builds on three principles: transportation, identification, and realism. Transportation explains how a narrative can influence a reader's belief by integrating attention, imagery, and feelings that occur in response to a narrative (Green & Brock, 2000). Narratives can aid that cognitive process. Identification is the action by the reader to adopt the perspective of a character (Busselle & Bilandzic, 2009). Realism is defined as a

judgment of authenticity from the reader’s point of view. Table 1 summarizes the theoretical view points and findings of prior research regarding fable-based learning.

Table 1. Research regarding fable-based learning

| Research Conclusions | Authors |
|--|-----------------------------|
| Narrative theory states humans are natural storytellers and interpret experience through narrative. | Fisher (1984) |
| Students preferred fable-based learning over traditional lecture. Struggling students’ performance increased more with fable-based learning. | Lee, Lee, and Lau (2006) |
| Students enjoy storytelling in mathematics and teachers find it an effective instructional tool. | Zazkis and Liljedahl (2009) |

Zazkis and Liljedahl (2009) categorize fable-based storytelling according to the goals of the teacher: to introduce a topic, to explain a concept, to ask questions that make the students reflect and think, or to introduce an activity. Hopfer (2012) expresses five key outcomes from storytelling as a knowledge-transfer tool: 1) ability to overcome resistance in the reader, 2) engage less involved audiences, 3) reach audiences that lack specific knowledge, 4) make complex information understandable, and 5) culturally ground the message to the target audience. We next explore the deeper cognitive processes that underlie transportation, identification, and realism by exploring how human cognition relies on metaphors, and an appreciative system of sense-making, to accept and utilize new knowledge.

The Role of Metaphor in Learning

Humans comprehend the world from two different perspectives: 1) from within the world, and 2) being surrounded by the world. Psychologist McGilchrist characterizes this dichotomy by describing the divided brain, i.e., right and left hemispheres (McGilchrist, 2019) This divided brain provides a context for understanding memory, cognition, re-cognition, abstraction, tacit knowing, learning, and imagination. A metaphor is a representation of or symbolic of something else, particularly something abstract (e.g., allegory, parable, analogy, emblem, etc.).

Of interest is McGilchrist’s assertion that metaphorical understanding is essential to the internalization of a phenomenon into tacit systems of knowledge. We know something because we experience through metaphorical internalization. Metaphor is the fulcrum that balances and integrates our objective and subjective comprehension of new phenomena to reconcile new phenomena against extant explanatory models of the world around us. Thus, metaphor, to which we ascribe the compelling components of the fictive narrative mechanics upon which fables rely, is a relatively timeless teaching device. It centers on coping strategies to engage that which is unfamiliar (Goldstein, 2005).

McGilchrist suggests that the brain’s right hemisphere contextualizes experience with our sensory systems. The left hemisphere serves as a comparison engine that categorizes and encodes experience into abstraction. Memory is constantly classified and categorized against metaphoric pictures available for further recall by means of association in context, sensory assessment, and analogical reasoning. Thus, the brain’s right hemisphere operates experientially in the present and the brain’s left hemisphere assesses sensory input from the right brain and searches for recognition through a catalog of related metaphors. In this sense, a story is disarming because the process of associating the hard facts of new phenomenon places greater cognitive load for the metaphor-processing left brain.

From McGilchrist’s observations, the brain’s right hemisphere filters and frames experience in parallel to recognition and thus allows for extant models to be verified. Fables can be used to reinforce the lesson over time where the fable is metaphorically “attached” to the “hard” lesson. These two sense-making engines, the brain’s left and right hemispheres, are cooperative and intraoperative in a constant metaphor-matching process. This is a process of recognition (a repeated reconsideration of new data against old) that forms the basis of recall and the ability to act competently against this recall in new situations. Recognition may be expedited and made more familiar when storytelling is utilizing in earlier stages of comprehension.

Metaphor Fuels Processes of Appreciation

Geoffrey Vickers (1983) characterizes the system of comprehending from the right- and left-brain partnership as one of appreciation. Appreciation

is also a reconciliatory process which includes the social dimension of reasoning from new experience and comparing the new experience to extant models to establish veracity. This is a knowledge-building process but one that is also grounded in social shaping. This leaves room for the crafting of fables as they are often grounded in a culture, a context, and laden with value and ethical assumptions. If a fable is meant to be both disarming and relatable, then the narrative in a fable must resonate with the learning for whom the fable was designed. The universality of themes in the narrative would assume that the ethical precepts in the fable are resonant across cultures and quasi-universal in nature.

The appreciative system conditions the comprehension of new experiences and is open for potential modification as a result of the encounter with new experience. Metaphorical and allegorical device deployed in fables and storytelling targets the learner's appreciative system. Education is goal-seeking. There are lesson plans designed to produce learning outcomes against goals, but the learner's appreciative system is the medium within which that lesson plan and pedagogy will take root.

Such systems are not honed and shaped independently of the communities in which the learner resides. These communities promulgate and reinforce common knowledge, norms, and routines that are acculturating in nature. The learner possesses a world-view grounded in the communities which have shaped them. Regardless of our description of a technical rationality that might dominate the world of education, business, and the professions, the rationality under which the learner operates at any given time is a complex amalgam that goes beyond binary descriptions such as "technical" or "reflective." Rather, the metaphors operating within fables serve as a tool to resonate within a learner's appreciative system, and the modes of rationality favored therein, to encourage incremental comprehension.

As we progress towards an account of fable-based learning, we ground storytelling and fables in the realm of metaphor. Metaphors serve as a tool to work with the learner's appreciative system and physiological systems of comprehension to facilitate familiarity with new concepts by disarming natural reactions to the unfamiliar when referents in our abstract mental models have difficulty in finding a match to new experience.

Principles of fable-based learning

Fable-based learning involves many of the same principles in any good storytelling. The key is to align the elements of the story with the teacher's learning objectives. Zazkis and Liljedahl (2009) identify seven principles to consider when creating a story for fable-based learning: plot, conflict, imagery, human meaning, sense of wonder, humor, and patterns. These same principles can be followed when writing a story for an exam.

Given the benefits of fable-based learning, we propose extending the same principles to the assessment phase of learning. Following a learning phase, the instructor wishes to assess whether learning has occurred. The most common assessment tool used in academics is the multiple choice exam (Xu et al., 2016). We explore the potential benefits of using a fable-based learning paradigm to multiple choice exams. We developed a story plot and inserted exam questions throughout the story. The following research questions are investigated.

1. Can fable-based storytelling be used to assess knowledge attainment?
2. What would an assessment exam which uses fable-based storytelling look like?
3. What are the potential benefits of an assessment exam using fable-based storytelling?
4. What constraints might exist with this type of assessment?

3. METHOD AND IMPLEMENTATION

When designing an exam, an instructor can write one long story and insert exam questions throughout the story (Figure 1). Each exam question could be a challenge or conflict that the main character needs to resolve. The advantages of a long storyline may include the following: 1) the exam taker may feel more immersed into a plot, 2) more complex plots can be presented, 3) and the single plot may foster a perception that the student is not taking an exam but interacting with a story.

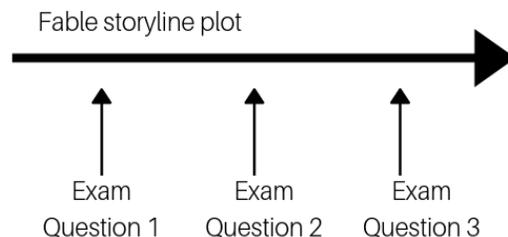


Figure 1. Integrating exam questions into a single, long plot.

An alternative method could be to create a different short story for each question (Figure 2). Each question becomes a very short story, like a mini-business case, not related to the other stories or exam questions. This method is easier to write as the author doesn't need to be consistent between stories. This method also allows the exam questions to be delivered in any question order.

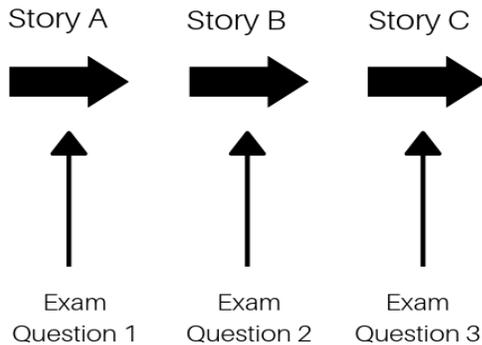


Figure 2. Each exam question could be a mini story not related to the others.

We chose to follow the first method of writing one long story with multiple questions related to the plot because a longer plot is more congruent with the principles of fable-based learning. We followed a seven-step process for creating the assessment:

1. Define the learning objectives
2. Write questions for each of the learning objectives. Consider Bloom's Taxonomy of Higher Cognitive Thinking to vary the types of questions across the different cognitive levels (Bloom, 1956).
3. Write an introduction that describes the setting and main characters of the story.
4. Add exam questions and possible answer choices to the story.
5. Write prose around the questions to integrate the exam question into the plot. Use the exam questions as problems that the main characters in the story must solve.
6. Review the story against Zazkis and Liljedahl (2009) six principles of fable-based learning.
7. Edit the story as needed.
8. Deploy the exam through an online learning management system.

Learning objectives

Before the assessment, the teacher should clearly define the specific learning objectives. Specific learning objectives are different than course learning objectives (CLO). CLOs are larger, broad

capabilities the students will accomplish after the course is completed. A course may have four to six course learning objectives. An example of a course learning objective could be "...transform web application design instructions into integrated HTML, CSS, and JavaScript code." Specific learning objectives are quantized, fundamental units of knowledge that the learner needs to accomplish which collectively achieve the course learning objectives. Examples could be "...demonstrate the use of class selectors when adding CSS styling to a div or paragraph" or "...create and link an external stylesheet to multiple web pages." A course may have a hundred specific learning objectives which are mapped or aggregate into the course learning objectives. The teacher assesses specific learning objectives through an exam or assignment. One question on an exam could assess a specific learning objective.

For this research study, specific learning objectives were determined by the instructors of a Management Information Systems (MIS) course. These objectives are listed in Appendix A along with the storyline and exam questions.

Plot

The story was written in second person so that the reader (student taking the exam) could insert themselves as the main character. The student assumes the role of a business executive in a fictitious company. The CEO of the company presents various business problems to several executives. The supporting characters ask questions related to the specific learning objectives of the exam. The student answers the questions. Knowledge of the principles of MIS is required to answer the questions.

Storyline and exam integration

The exam questions need to be integrated into the storyline. One way is to have supporting characters ask questions of the main character. The student answers the questions posed by the supporting characters. An example is as follows.

You work for a consulting company called IBG, Inc. Your CEO calls you into a meeting with many other executives to discuss problems and solutions to the company's efforts. David starts by saying, "Thank you for coming. I was on the plane yesterday from Asia and read in a magazine article by Tom Friedman on how Toshiba uses UPS to do repairs for Toshiba customers. Toshiba customers make a request for a laptop to be repaired. UPS picks up the laptop and takes it to a UPS warehouse where UPS employees fix

the laptop and return it to the Toshiba customer without a Toshiba employee touching the product. This has costs and speed advantages for Toshiba. I think Friedman called this brown sourcing. "

You laugh and quickly stop yourself.

David says to you, "What? Do you have something to say?"

You reply, "I'm sorry. I didn't mean to laugh. Permit me to correct the term. It's not brown sourcing. Friedman called the process "

Question 1. What term describes the process David is referring to (according to Tom Friedman's The World Is Flat)?

- A. Offshoring
- B. Insourcing
- C. Informing
- D. Open sourcing

David replies, "Thanks for correcting me. I appreciate it and am not above correcting. Let's move on."

We chose to write in second person form so the student takes the role of one of the characters in the story similar to a "choose your own adventure" story. An alternative is to write the story in third person form. In the third person form, the main character is observed by the reader (student). The narrator temporarily pauses the story to ask questions of the reader (student taking the exam). Third person form is similar to the method used by Dr. Stuckey and Dr. Ho Man Lee in their course Basic Modeling for Discrete Optimization using folklore-based learning. The instructor interrupts the narration to explain to the student the problem presented in the plot. The instructor explains and demos how mathematical optimization with software resolves the problem presented in the story. A similar process could be used for an assessment exam but the narrator asks the student to solve the problem without instructor help.

Deployment

The fable-based exam was used in principles of Management Information Systems course (MIS) with approximately 40 undergraduate students in a college of business. The course was delivered online. Deployment was through a learning management system with automatic grading. The Blackboard learning system does not have a mechanism for writing text between exam questions, so the prose related to each question

was included in the question text. The questions were ordered in sequence according to the plot.

The research purpose of deploying the sample exam was solely to demonstrate its use and work out any logistical problem, which there were not any. The purpose was not to statistically analyze any results or test hypotheses. Future research can conduct hypothesis testing with a positivistic lens for causal explanations. The purpose of this study is to demonstrate that the fable-based learning principles can be extended to assessment exams and motivate a new line of research study.

4. DISCUSSION

Fable-based learning can be an effective and fun method of presenting content for learning. The instructor crafts a story with embedded problems to be solved. The learner explores the problems and solutions through the main characters of the story. There are many examples of using fable-based learning to replace a traditional lecture-based pedagogy. Using the same principles as fable-based learning, we extend the use of fables and narrative stories into the assessment phase of pedagogy. The purpose of this research was to identify the uses and principles of fable-based learning, discuss how to apply those principles into assessment exams, and demonstrate an example of the said exam.

We presented earlier eight steps for an instructor to follow when creating a fable-based examination. We refer the reader to the work of Zazkis and Liljedahl (2009) who present a detailed how-to guide for writing fable-based learning stories: plot, conflict, imagery, human meaning, sense of wonder, humor, and patterns. The same skills can be applied to writing a fable-based exam.

As researchers and educators, we reflect on the needs that led to creating our fable-based exam. Each year, faculty teaching the MIS courses write a post-semester reflection as part of our processes of assessment and continuous improvement. As a procedure to track assessment for our program's ABET accreditation, an analysis of those reflections led to the following conclusions that have inspired this work. The MIS course was habitually rated low by students and not valued by other college of business faculty. Students did not value the content and frequently reported boredom with the course. This observed and reported boredom and lack of engagement had impacts on learning retention. Further, the course was mainly

textbook-based where students read chapters in a publisher's textbook, attended lectures, and were assessed via traditional multiple-choice exams.

In response, we redesigned the course content to be more relevant to student's needs, particularly those more relevant to the tasks they would encounter in the first five years of their post-graduate employment. The learning objectives were also redesigned to align with the other courses in the college's core curriculum. We abandoned the publisher's textbook and were not satisfied with other publisher alternatives. We also wanted more hands-on and experiential problem solving. As part of the changes, we adopted the Harvard Business Case, *The Adventures of an IT Leader*, which is an example of fable-based learning (Austin et al., 2016). This case was successful at engaging students, holding their interest, and in removing some barriers and resistance to learning. As a natural extension, we designed fable-based learning into the assessment exam given its success as a teaching device. While success of the new MIS course cannot be solely causally assigned to fable-based learning and fable-based assessment, those were important and prominent tools that helped turn the course around. Regarding the fable-based exam, one student commented, "That was the most fun exam I have ever taken!"

Potential advantages

The potential advantages to using fable-based exams may be similar to those already attributed to fable-based learning: increased cognitive focus and engagement (Green & Brock, 2000), increased perceptions of realism and application of the knowledge (Davidhizar & Lonser, 2003; Goldratt & Cox, 2016), and intuitively answering the students question of "why do I need to know this?" or "how would anyone use this?" We propose this type of exam also may increase retention of knowledge because fables and metaphors may increase salience (McGilchrist, 2019). Increased salience, according to the metaphorical connections made possible through storytelling and narrative, can be linked to increased recall. The use of storytelling in an exam may also increase the hedonic response in the learning and assessment processes as the stories are disarming in that they adopt familiar themes and a familiar delivery (Robbins, 2006).

Returning to Narrative theory, humans are natural storytellers and learn through interpreting experiences. Fable-based exams appeal to our affinity for stories. Stories can be leveraged to reduce resistance to learning and help the learner

interpret experiences in the story to their own problem-solving experiences. In this manner, the learner can identify with the characters in the story as they solve problems and, concomitantly, as the learner solves problems on the assessment exam. Through the process of metaphorical comprehension, fables increase retention of knowledge because the information has increased salience where this increase in salience is linked to an increase in retention (McGilchrist, 2019). This further aids in learners' perception that a new topic, which has fewer metaphorical referents in their appreciative system, as being less boring, more challenging, and more stimulating (Lee, Lee, & Lau, 2006).

In this section, we proposed potential benefits of fable-based exams leaning on the existing literature regarding the benefits of fable-based learning. These claims are yet to be substantiated and we encourage researchers to explore this potential and to quantify the benefits.

Potential challenges

Some challenges exist with fable-based learning and may translate to assessment. The process is time consuming. Writing a story is an additional task after defining the learning objectives and writing the exam questions. Storytelling may not be among the instructor's strengths, particularly in a STEM field where the instructor's background may not have emphasized these skills. As such, new skills may need to be learned and practiced. New partnerships with those who are stronger at storytelling and writing may be needed.

When using fable-based exams, instructors should consider impacts on anti-cheating mechanisms. Unfortunately, cheating is common in adult education. Multiple choice exams lend themselves to cheating because students can easily share questions and answers, particularly in online courses. However, this is not a new problem. Two possible methods for anti-cheating are: 1) to randomize the questions and, 2) randomize the order of the answers. With fable-based exams, the questions cannot be randomized because doing so would break the flow of the story. Randomizing the order of the answers is still possible. Many content learning systems provide this feature.

The aim of this paper is to stimulate a new area of research. The contributions are the idea of a single-plot narrative used in an assessment exam, an example of said exam, literature review of Narrative Theory, metaphoric learning, and fable-based learning which can be used as theory development in future fable-based assessment research, discussion

of potential challenges to using this approach, and resources for instructors/researchers who wish to develop their own fable-based assessments (i.e., Zazkis & Liljedahl, 2009).

Future study

Having identified principles of fable-based learning and demonstrated the application of these principles to fable-based assessment, we hope to encourage further research into the use of fables in Information Systems education. Future areas for research may include the determination of the hedonic reactions of a fable-based exam compared to traditional methods of examination. Studies have shown that students quickly forget the knowledge learned in their courses. We may want to determine whether students retain and recall knowledge longer after a fable-based exam. A mid-term, offered as a fable-based exam can be reevaluated in a final exam and compared to the results of traditional examination assessments, also deployed at mid-term and at the end of the course. Further related questions are: Do students have greater focus and cognitive engagement during a fable-based exam? What are the student's perceptions of fable-based exams? Do students perceive problem solving through fable-based exams as more applicable to the real-world? Can learning outcomes be improved with fable-based exams in a manner that is commensurate with fable-based learning? As exams are often associated with high anxiety, can fable-based exams reduce anxiety? Because some students report that they are not good test takers, might fable-based exam be perceived as more natural to real-world problem solving and help those who struggle with traditional examination methods? Future offerings of the MIS course can compare a fable-based exam to a traditional multiple-choice exam to explore these research questions. Further, we can use the type of examination, fable-based vs. traditional, as an experimental treatment in different sections of the course controlling for online or ground delivery.

5. CONCLUSION

There are many positive benefits to learning already demonstrated by using fable-based learning. We encourage instructors to use more fable-based learning and to conduct their assessments of learning using fable-based techniques. We further encourage researchers to explore perceptions of and causal relationships to learning afforded by fable-based assessment strategies. The cognitive fit that metaphor-driven fables provide offers a compelling new direction to assist our learners.

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Appendix A: Example of a Fable-based Exam

The following example is of an exam that uses fable-based storytelling. This exam was deployed in the management of information systems introductory course (MIS).

Learning Objectives

This exam assesses the following learning objectives relevant to the MIS course:

1. Students will be able to identify technology-based flatteners according to Tom Friedman.
2. Students will be able to distinguish types of collaborative writing technologies and workflows.
3. Students will be able to define the following terms B2B, B2C, B2G, C2C, or C2B.
4. Students will be able to recognize the application of a knowledge management system, knowledge discovery process, and of artificial intelligence in business.
5. Students will be able to recommend a technology for a given business need based on our in-class student technology presentations. Note: As a separate assignment, students researched various technology and then gave a five-minute presentation on the potential business application. This learning objective and related exam questions assess that learning was retained after the technology presentation assignments.

The answer to each question is identified with an asterisk.

Beginning of Exam

Read the following story and answer the related questions as if you were in the story.

You work for a consulting company called IBG, Inc. Your CEO calls you into a meeting with many other executives to discuss problems and solutions to the company's efforts. David starts by saying, "Thank you for coming. I was on the plane yesterday from Asia and read in a magazine article by Tom Friedman on how Toshiba has UPS does repairs for Toshiba customers. Toshiba customers request a laptop to be repaired. UPS picks up the laptop and takes it to a UPS warehouse where UPS employees fix the laptop and return it to the Toshiba customer without a Toshiba employee touching the product. This has costs advantages for Toshiba. I think Friedman called this brown sourcing. "

You laugh and quickly stop yourself.

David says to you, "What? Do you have something to say?"

You reply, "I'm sorry. I didn't mean to laugh. Permit me to correct the term. It's not brown sourcing. Friedman called the process _____"

Question 1. What term describes the process David is referring to (according to Tom Friedman's The World Is Flat)?

- A. Offshoring
- B. Insourcing *
- C. Informing
- D. Open sourcing

David replies, "Thanks for correcting me. I appreciate it and am not above correcting. Let's move on." He continues, "We need to write a business plan with our partners in Asia. Because they are in another time zone, we can't feasibly do conference calls to discuss the proposal. Instead, I want us to organize a team of writers and send the documents back and forth. Each person on the team will take a turn writing the proposal and then pass it on to the next person. Only one person at a time will be writing but I don't see any option. "

Question 2. Which of the following describes David's suggested method of writing?

- A. Asynchronous writing *
- B. Synchronous writing

David commented "I don't see any option, "referring to how to write where people each take turns. Joe asks, "But with everyone taking turns writing how will we know who made what changes and additions? I did this in college and it was a nightmare. I'd write a paragraph only to have someone else accidentally delete it and we didn't know. "

You offer a suggestion, "There is a feature in MS Word that can identify every author's contributions to the paper. It highlights any deletions or additions and who make the change. We can accept or reject people's changes when we are all done taking turns writing."

Joe asks, "That sounds cool! What feature is it?"

Question 3. You answer Joe's question of 'What feature is it?' with the following response:

- A. Track Changes *
- B. Insert Comments
- C. Compare Documents
- D. Restricted Editing

To the idea of how to organize a team of collaborative writers, you also suggest "Instead of taking turns writing, we could employ a different strategy. I learned in my CIDM3330 class that there are alternative strategies for organizing teams. For example, Jane is an awesome editor and grammaticist. Joe is very good with illustrations. Huyn is a good writer even though English is his second language and he knows the conditions in Asia so he can write about that. David knows the conditions in the US and can be a writer too. I can be a reviewer that reviews everyone's contributions because I use to be a peer-reviewer for a publication and it's my strength. This was everyone contributes based on their strengths rather than everyone doing every task."

David says, "I like that idea. I knew we hired a good person when we got you. What do you call that collaborative writing strategy?"

Question 4. You respond with, "According to the Lowry et al., paper (2009) that I read that strategy of writing is called _____."

- A. Reactive writing
- B. Parallel writing
- C. Sequential writing
- D. Group single-author writing
- E. Stratified-division writing *

In the executive meeting, you just outlined some strategies for collaborative writing. David responds with "I like the idea." Joe response with "I like the idea to. I really like illustrations and graphic design but I don't like writing. But what do we do next? What are the tasks we do and in what order?"

You go to the whiteboard and write down seven common activities of collaborative writing and put them in the order of operation.

Question 5. According to the Lower et al paper (2009), put the following collaborative writing activities in order of which comes first, which comes second, etc., and which comes last.

- A. Brainstorming *[Answers are in list order]
- B. Converging
- C. Outlining
- D. Drafting
- E. Reviewing
- F. Revising
- G. Copyediting

With the collaborative writing team organized the executive meeting moves to another topic.

Joe asks "David, with your meeting in Asia, is the Yoshi firm a B2B, B2C, B2G, C2C, or C2B?"

David replies "Yoshi firm primarily does B2B."

The new secretary fresh out of college leans over to you and quietly asks "What is B2B?"

Question 6. You respond with the following statement that defines the term "B2B"

- A. Businesses are Yoshi's primary customers *
- B. Consumers are Yoshi's primary customers
- C. Governments are Yoshi's primary customers
- D. Consumers selling to businesses

David, "Ok folks, we need to talk about our online marketing. We spent \$1000 on Pay Per Click advertising and unfortunately it didn't produce good results. Any other ideas?"

Joe "I have an idea. Instead of paying for clicks we can pay for when prospects actually sign up for a free trial of our product. Paying for the clicks just means someone saw our website but didn't actually do anything. This alternative allows us to only pay for when a prospect actually does something we want them to, like request a free sample of our product or sign up for one month trial. Website will advertise for us and we'll pay them for results not just visitors who browse. "

David, "Is it more or less expensive than Pay Per Click? We only paid 55 cents per click."

Joe, "55 cents is cheap, but the results were cheaper, after \$1000 we only had one new customer. With this alternative, we do pay more, perhaps \$5 to \$10 per signup, but we get real prospects, not just curiosity seekers. And, with a lifetime value of each customer at \$400, spending \$5 to acquire new customers is a drop in the bucket. But I don't remember what this alternative to Pay Per Click is called?"

Question 7. You answer Joe's question with which of the following:

- A. Article Marketing
- B. Pay Per Action *
- C. Pay Per Impression
- D. Pay Per Click
- E. Search Engine Optimization
- F. Back-linking strategies

David, "Ok, so we need to help human resources communicate the new health insurance policies. Rather than sending 100 emails to all the employees what other ideas can we do to help the HR department disseminate information? "

Beth says "I remember in my MIS course at college that we had a topic like this. Let me remember. I forget the name of the thing, but it allows many authors to add content to a website. And all the company employees can visit the internal website to have their health insurance questions answers. We can even have comments areas for employees to ask questions. The human resource personnel can be authorized to add content to the site and the other employees can read and post comments and questions. HR people can write little articles and post them to help our employees know how to sign up for insurance, know how to take care of themselves, etc. If I can only remember what that was called?"

David, "HR is not technical. They don't have to know how to program a website do they?"

Beth, "No, not at all. We even did this in our course and you all know I'm not technical at all, but I don't remember the name of it?"

David, "Sounds great! Who knows what Beth is talking about?"

Question 8. What's the term that answers David's question?

- A. Knowledge management systems *
- B. Knowledge Discovery Process
- C. Artificial Intelligence
- D. Insourcing

David asks a follow-up question about collaborating with the colleagues in Asia, "We need to synchronize all the project files, photos, proposal documents, financial documents, etc. with our counterparts in Asia.

I don't want to be emailing the documents back and forth because that's a sure way to lose a document or have it leak to the public. Any suggestions?"

Joe whispers, "I email my bank statements all the time without any problem." You kick him under the table.

You respond to David with "I have a suggestion. We can use a free software service that encrypts our files and stores them online. The company gives us free storage online for 2Gigs and we can buy more storage if we need it."

David asks, "But how does that help us?"

You continue, "When you download this software onto your computer it creates a special folder. Anything you put in that folder will be automatically synchronized with any computer that you share that folder with. You can even have it share and synchronize with your phone or iPad."

Joe exclaims, "But I'm an Android-tablet guy, not a Mac user!"

You continue, "It works and synchronizes your files with a PC, Mac, and many types of mobile devices, including iPhones and tablets. So, when I make add a project file to the folder, everyone on the team automatically gets the new file. If someone edits an Excel spreadsheet, the updated file is automatically synchronized with everyone. That way we keep all our project files in one folder and synchronized with the entire team. I saw a technology presentation on this method of collaboration and now use it frequently myself."

David smiles proudly and asks "Sounds good. What's the name of the technology?"

Question 9. According to the technology presentations seen in class, what is the name of the technology David is referring to?

- A. DropBox *
- B. Prezi
- C. Team Speak
- D. SmartThink
- E. CCleaner
- F. Monkey on Your Back
- G. Sage Act
- H. Smart Thinking
- I. Windows' One Drive

To finish the meeting, David plugs his laptop into a projector, "I'll show you the prototype that our Asian counterparts have built." He fiddles with his Windows computer. His computer becomes unresponsive, takes a long time to open an internet browser, and David starts murmuring under his breath "Darn, stupid computer. Always slow. Why can't you work?" not realizing everyone can hear and see his frustration. You suspect he has problems with his Windows Registry and old programs causing his computer to be slow and unruly. You type a quick email to David on your iPad and recommend one of the following free software to help David tune up his computer.

Question 10. According to the technology presentations seen in class, what is the name of the technology that will help David?

- A. DropBox
- B. Prezi
- C. Team Speak
- D. SmartThink
- E. CCleaner *
- F. Monkey on Your Back
- G. Sage Act
- H. Smart Thinking
- I. Windows' One Drive

Because of technical problems with David's computer, he defers the time to Joe. Joe gives an amazing presentation on the sales in Asia. The presentation is novel and inspiring, in part because he does not use MS Powerpoint. His alternative has stunning graphics and zooms into parts of the graphic, which displays his content. He even had an embedded video play. Everyone is impressed. As he sits down next to you, you ask Joe, "Awesome presentation. What did you use to create that?"

Joe responds "I used a free service on the internet called ..." Bang! Crash! Just then someone drops several books and you didn't hear what Joe said.

Question 11. According to the technology presentations seen in class, which technology did Joe use?

- A. DropBox
- B. Prezi *
- C. Team Speak
- D. SmartThink
- E. CCleaner
- F. Monkey on Your Back
- G. Sage Act
- H. Smart Thinking
- I. Windows' One Drive

END OF EXAM