A Developmental Research of Interactive Fiction

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Definition of Interactive Fiction

Interactive Fiction provides a fictitious world in which the learner will often assume the role of the protagonist. According to Montfort (2002), a definition of Interactive Fiction contains the following attributes:

- “a potential narrative, that is, a system which produces narrative during interaction;
- a simulation of an environment or world; and
- a structure of rules within which an outcome is sought, also known as a game.”

(Montfort, 2002)

*Additionally, for the purpose of this research, I am adding that “interactive” refers to the requirement of judgment-based action by the learner.

Underlying Theory

The underlying theory of this interactive fiction is the philosophy of constructivism. According to Rieber (1994), “Constructivists usually define instructional technology as the generation of computer-based tools that provide rich and engaging environments for learners to explore.” These environments commonly refer to games, simulations, and microworlds in which the learner becomes situated as a character (Rieber, 1994). IF involves learning in the constructivist manner by placing the learner into a situation in which he will actively make meaningful choices and receive meaningful feedback in the way of plot movement. As the basis of Constructivism is that learning is built or constructed in an active manner by the learner, Jonassen (1996) cites the following fundamental principles: “Learning is an active process of constructing rather than acquiring knowledge, and
instruction is a process of supporting that construction rather than communicating knowledge” (p. 171).

**Literature Review**

Yeaman et al. (1996) mentions interactive fiction (IF) as children’s literature in metamorphosis. Briefly, IF as text encompass non-linear types with the most common example consisting of the “choose your own adventure” series. Two examples by Yeaman (1996) include the texts “Black and White” and “Five Secrets in a Box.” Black and White is a large picture book which presents four stories simultaneously by divided each page into four quadrants. In addition to simultaneous story pages occurring on each large page, “intertextual references” are made throughout the stories. Five Secrets in a Box is outwardly the story of Galileo’s daughter, but the book itself contains details in areas outside of the regular text. Details which may alter the story occur on inside flaps or back covers. As it is summarized in Yeaman,

“Thus once again, we have a postmodern text aimed clearly at very young children which violates all traditional rules of storytelling and in so doing features multiple contradictory texts and messages” (p. 263).

Current research citing the effects of IF is scarce. Findings in Jonassen (1996) present that “Research on interaction methods may be among the most critical. There is a vast area of possibility, yet little research has been conducted thus far” (p. 384). As far as research in the area of IF alone, most focuses on the development of believable story characters or teaching specific lessons. However, upon constructivist principles, the learner should be able to transfer the new knowledge to the general real world.
Research of the ERIC database presented no results for “non-linear text.” ERIC results in “Interactive fiction” referred to electronic sources and addressed literacy, vocabulary, and ethics. A search for “postmodern text,” grouped with interactive fiction showed 72 results while addressing either postmodern topics/content in text or integrating postmodern text into curriculum. The lack of research in interactive fiction may be partially attributed to the inadequate degrees of interactive fiction definition and theory. According to Jonassen,

“There is little consensus with regard to the design of human-computer interactions. Indeed, disagreement even exists about the meaning of the term interactive as applied to emerging technologies” (pp. 384-5).

Earlier, I defined Interactive Fiction as a variation of a definition by Monfort (2002) to follow. Recall that a definition of Interactive Fiction contains the following attributes:

• “a potential narrative, that is, a system which produces narrative during interaction;

• a simulation of an environment or world; and

• a structure of rules within which an outcome is sought, also known as a game.” (Montfort, 2002)

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The original definition by Monfort included a computer element and left out the reference to “interactive” as requiring judgment-based action by the learner. I thought it important to add the latter line of the definition and remove the computer as a necessary
component. There are, in fact, many “interactive” components to a hand held book. Readers of paper books often skip to the end, browse sections ahead of time and even close the book without ever finishing it from cover to cover. Therefore, either a paper book or computer could theoretically serve the same purpose. Also, in keeping with the NSD findings, a computer is not a necessary component for IF. Thus, my earlier definition was in agreement with Monfort’s definition with the exception of the computer component.

Though IF is an overall limited area, there are several beginnings toward promising research. While most ERIC search results did not address a researched area of effective interactive fiction, Vivienne Smith’s article called for more critical attention in the area of lift-the-flap books as postmodern text. Several articles found in the Wilson Select database explored reading comprehension as an effect of interactive stories. It was found that for beginning readers, interactive choices disrupt reading comprehension. Therefore, interactive fiction should not be used until children have a full grasp of reading. A qualitative study by MecLellen (1992) showed that children are able to adapt to interactive presentation. However according to Jonassen, “whether children can understand all – or even some – of the subtleties is open for research” (p. 262).

Frear & Hirschbuhl (1999) found that interactive multimedia significantly improves achievement and problem solving skills in science. The arrangement seemed to mirror the architecture as described in the Oz Project, as explained in the “design” section to follow. Frear & Hirschbuhl’s setup placed the student as a science official who must make decisions based on data collection. The authors cite a possible explanation for
achievement in problem solving skills lies in the meaning developed by a learner during this interaction with course material.

**Design Issues**

Although this section will review many available design considerations for interactive fiction, I am foremost basing the development of this project upon the standards for instructional multimedia design and development as set forth by Alessi & Trollip (2001). The following summarizes the above mentioned standards.

**Subject matter**

- Matching goals and objectives - Subject matter should neither too shallow nor too in-depth. Shallowness may bore a user while too much depth may cause frustration.
- Content structure – It may be of benefit to show the organization of content to the users by way of outline, map, or diagram. It should not be assumed that users are naturally familiar with the organization.
- Accuracy of the subject matter – Facts and terminology should be correct.
- Language, style, and grammar – The reading level should be appropriate for the audience. Stereotypical roles and language references should be assessed and weighed in terms of cultural bias. It may be impossible to eliminate all cultural bias. Jargon and acronyms should be avoided. Someone other than the author should check spelling, grammar, and punctuation.
- Glossary – Programs may benefit from a glossary. The glossary should be easily assessable.
• Hot words – Hot words are an option to a glossary. When the user clicks over a “hot word,” the definition is given.

**Auxilliary information**

• Introduction – An introductory section provide information such as prerequisites, goals, time requirements, why the program is relevant and what the user can get out of it.

• Directions – Some programs may not require directions. Depending upon the complexity of the program, directions may be either simple or detailed.

• Help – Help should be accessible from anywhere in the program. Depending upon the purpose of the program, there may be one universal link to help or help options may change according to context.

• Conclusion – A program should have a conclusion that lets the user know he or she has completed the program successfully or unsuccessfully. The user should be given a feeling of closure from the conclusion.

**Affective considerations**

Motivation should be a goal of the program. Assessments should be done to minimize anxiety and increase ease-of-use. There should be an appropriate level of challenge, and attention, satisfaction and confidence should be maintained. Motivation should be sought in balance with instructional features. Motivation may be either intrinsic or extrinsic.

**Interface**

• Displays – Every display should be considered in terms of aesthetic quality. Screens should be uncluttered and relevant to the goals of the program. Information should be ordered from the top left to the bottom right.
• Presentation modes – The use of text, graphics, color, and sound or video should only be used when appropriate. If audio or video are used, the user should have control options. Text should be displayed so that minimal scrolling, if any, is required. Animation and/or graphics should reinforce the purpose of the program. Graphics should contain the proper amount of detail required and look professional. Animation should be neither too slow nor too fast. Caution should be used with very complex graphics as they may take too long to load if viewed on the Internet. Audio and/or video should only be used if it contributes to the purpose of the program. The level of quality and amount of time needed to download should be acceptable. It should be assessed as to whether audio and video will run on the computers of the target audience. The program should contain any user controls that might be necessary.

• Input – Input devices, such as a mouse or keyboard, should be appropriate for the required activity.

• Spacing – Conventions for spacing should be consistent. This refers to spaces between sentences, hyphenations, page breaks, etc.

**Navigation**

• Navigation aids – Navigation aids (maps, menus, arrows) are suggested for complex programs. Users should be notified of the typical time length per section.

• Consistency – Navigation methods should remain constant throughout the entire program.
• Restarting – In case of an accidental exit or computer outage, the programming should allow the user to restart at a point close to where he or she left off.

• One option for restarting is to include a “bookmarking” feature. Bookmarking includes the ability to mark one’s place and may be automatically placed where the user leaves off or used selectively by the user at any point.

**Pedagogy**

• Methodologies – Instructional methods should be appropriate for the content, audience, and learning outcome.

• Interactivity – Various interactive elements should be sought. Examples of interactivity include “making choices and decisions, composing, taking notes, making evaluations and judgments, constructing, drawing, and controlling.” Interactivity should be relevant to the purpose of the program and enhance comprehension, memory, or real-world transfer.

• Cognitive Capacity – Learners can keep five to nine unrelated pieces of information in short-term memory at a time. The program should not exceed this. Information should be broken up and interspaced by activities. “Page turner” programs should be avoided. Therefore, there should not be exceedingly long pages of text.

• Cooperative Learning – If cooperative learning is desirable, can the content of the program be amended to “foster good cooperation and provide a good method for the learners to work together.”

• Learning Metaphor – For some programs, it may be desirable to use a visual metaphor that can tie content together.
• Learning Strategies – “Learner strategies are self-initiated activities a person engages in to facilitate learning. Although they are self-initiated, a program can provide features that enable or facilitate such activities.”

• User Control – Learners should have some level of control via navigation and audio/video controls. It is often not desirable to force the learner down only one path.

• Questions – Questions presented to users should be relevant to the purpose of the program, be appropriately placed, and allow the user to think and process material.

• Answering Questions – When questions are presented, the method of answering or type of answer required should be made clear to the user.

• Quality of Feedback – Feedback should be clear, constructive and supportive. Slang or demeaning remarks should be avoided. The feedback should relate to the users input and should differentiate between right and wrong.

• Format of Feedback – Feedback should be given in a way that attracts the user’s attention. Small and single words may be overlooked.

• Mastery Level – There should be some point at which the user’s participation in the program is considered successful. It should be determined what represents this success, either by mere program completion or test.

Invisible features

• Records and Data – Depending upon the purpose of the program, it may be desirable to record data such as individual test scores. If data is to be kept, accuracy should be accounted for.
• Security and Accessibility – According to the Privacy Act of 1974, information should only be displayed to those who have a legal access right. As such, students should not see each other’s scores.

• Too much Data – If a program is to store data, there should be a means of deciding what happens to extra data. If a program is set to record the actions of twenty people, what happens with the twenty-first person? Will that person’s data be ignored or will it replace the data of the first person? Instructors should be given options for dealing with too much data, and the programs should be tested for errors at points at which much data is stored.

**Robustness**

An ideal robust program will never fail. Programs should thoroughly tested on various browsers, operating systems and conditions from the user’s viewpoint.

**Supplementary materials**

• Manual-General Aspects – A manual should have a table of contents and index, program reference guide, required equipment listing, any necessary warnings, and information for reaching technical assistance.

• Manual-Program Operation – Most manuals contain information on how to start the computer, start/load the program, operate the program, exit and shut down. If data is to be stored, directions for data storage should be included. Directions for backing up the program should be included. It may be necessary to include a learner manual and an instructor manual at different reading levels.

• Manual-Program Content – If learning content is provided in the manual, the content should be accurate.
• Auxillary Materials – No necessary materials should be left out. Provisions should be made if the program is to be used by multiple learners. If the manual provides forms that learners must fill in as they go through the program, the forms should be easier to photocopy. Another option is to provide each learner with his or her own manual.

Further available design issues follow. As previously mentioned, these will not be the emphasized considerations of this IF project. However, I am covering the following in attempt to present a complete review of existing material.

First, Moallem 2001 states that a widely used design and development model for computer based learning is that by Jonassen. Jonassen’s “Constructivist Learning Environment” model can be summarized with the following eight design principles:

1. “Create real world environments that employ the context in which learning is relevant;
2. Focus on realistic approaches to solving real-world problems;
3. The instructor is a coach and analyzer of the strategies used to solve these problems;
4. Stress conceptual interrelatedness, providing multiple representations or perspectives on the content;
5. Instructional goals and objectives should be negotiated and not imposed;
6. Evaluation should serve as a self-analysis tool;
7. Provide tools and environments that help learners interpret the multiple perspectives of the world, and
8. Learning should be internally controlled and mediated by the learner (pp. 11-12)” (Moallem, 2001).

Additionally, Moallem 2001 summarized instructional design concepts that are central to the constructivist framework. The five concepts include the following:

1. “Learning is embedded in a rich authentic problem-solving environment;
2. Authentic versus academic contexts for learning are provided;
3. Provisions for learner control are incorporated;
4. Errors are used as a mechanism to provide feedback on learners’ understanding; and
5. Learning is embedded in social experience” (Moallem, 2001).

By designing IF upon constructivist principles, the student is forced to actively engage in the learning process and create meaning. In addition to constructivist learning, the design of IF must also include consideration of postmodern text principles. IF, as suggested in Jonassen (1996), is postmodern text. As found in Jonassen (1996), the following practices are founded upon postmodern principles:

- Forms of authority and knowledge - There should not be a single source for authority. Multiple sources should be presented.
- Concerns for the individual - There should be an allowance for individual differences rather than a focus on the “average” students.
- The material base - Focus of courses should change from “content” to “process” as it is accepted that information is never final.
• View of history - There should be a consideration of diverse national histories.

• Place of community and tradition - There should be an inclusion of a multinational community.

Additional considerations within the postmodern principles include aesthetics and the following as listed in Jonassen (1996):

Text Issues:

• Hypertext - Though most text is unstable, hypertext is founded in postmodernism as it is non-linear and non-sequential.

• Textbooks - Textbooks are not neutral and should not pretend to be so. Text that works is non-linear or interactive (example: “choose your own story adventure”).

• Simultaneous versus sequential presentation - Postmodernists should avoid sequential presentation (example: 4-quadrant story book mentioned earlier).

• Multiple texts and messages – Books can make use of uncommon or hidden areas that make the receiver “go beyond the book.”

Issues of realism:

• Realism – Avoid an ideology in which there is no understanding or appreciation of the individual.

• Symbolism – Reject “a truth” so that other realities may be created.

• Representation – (Receiver versus Reader) – The receiver leaves the sender empowered. The reader is empowered by forming meaning and understanding.

Program/Text Design Example of IF

Kelso, Weyhrauch, and Bates (1992) developed the Oz Project at Carnegie Mellon University (CMU) as a computer system that would allow artists and authors to
create interactive drama. “Interactive drama” refers to “the presentation by computers of rich, highly interactive worlds, inhabited by dynamic and complex characters, and shaped by aesthetically pleasing stories” (p. 1). These stories may appear graphically as animation or text. The Oz Project team’s focal area is threefold including character development, presentation, and drama. Research literature that does relate to the Oz Project, as well as much of IF development, is focused solely upon the building of believable characters.

Hayes-Roth (1998) recounts the original interactivity of Lewis Caroll’s Alice in Wonderland based upon seven principles for character-based interactive stories:

- Principle 1 states that the participant should be in control of the protagonist’s character and interact directly with the other characters in the story.
- Principle 2 states that this interaction by the participant be “channeled along the dramatic arc of a story plot.”
- Principle 3 states that this interaction should be meaningful.
- Principle 4 states that the interactive world should contain more characters than can be encountered in one visit.
- Principle 5 states that the other characters should display autonomy in actions toward the participant.
- Principle 6 states that the plot should be designed so that the choices of the participant create an individual experience.
- Principle 7 states that the story should be monitored and kept on track by “an adaptive story master.”
Caroll’s original creation of the story was told to his student, Alice Liddell, and her two sisters on a daily basis. Each day, Caroll would alter the story according to Alice’s behaviors and attitudes. Rather than being forced to sit still, the girls were encouraged to react throughout the story in order to stay involved and interested. The character of the white rabbit was added as a means of keeping the story back on its central path, or as the “adaptive story master” mentioned in principle 7. Not only does the rabbit first lead Alice down the whole to Wonderland, he then appears to pull her out of trouble at each turn.

Stern (1998) discusses character creation in his design of “Virtual Petz.” He first defines interactivity as the computer’s “ability to listen, think, and react intelligently to the audience (or user).” He suggests beginning a story by defining the characters. It is most likely in IF that the user will interact by assuming the role of one of these characters. Further, it is not necessary that the character be truly alive as long as the character is believable. When programs respond to users, users have tendencies to believe that these programs are more intelligent than they are. This is known as the Eliza effect, which Stern claims is the most powerful piece for a creator of interactive fiction.

Murray (1998), professor of an “interactive fiction” course at MIT admits that there are no “organized curriculum” for training those who develop interactive stories in Building coherent plots in interactive fiction. Essentially, the question that need to be addressed in interactive fiction resemble those of simulations as follows: “What rules does this world obey? How do we shape participation rituals? How do we signal the interactor’s location as he or she moves through the world? How do we shape choice points so that they offer a sense of dramatic agency? How do we communicate world
boundaries, so that interactors know likely events? How do we entice the interactor into patterned activities that result in the active creation of belief in the imagined world?” (p. 19).

Based on Reeves’ (2000) suggestion of pursuing development goals, this research will explore interactive fiction as a creative approach to teaching and learning. Research results would have implications for future research and design in the areas of critical thinking skill, higher order thinking skill, problem-solving, constructivism, postmodern text, and interactive fiction. A positive outcome of my proposal would impact choices of reading instruction implementation as well as children’s literature design.
METHOD

This is a developmental research study in which the development of an interactive fiction prototype will be developed under the generic ADDIE design model. The steps of the ADDIE design model to be followed include the following: Analyze, Design, Develop, Implement, Evaluate.

Analysis

The target audience will be students in the fourth or fifth grade with a minimum third grade reading level. The pool of participants should include both male and female. The age level of the students will be between nine and eleven years of age. There is no specific academic subject being taught by the interactive fiction. Therefore, prior subject matter knowledge by students is not an issue. The interactive fiction is meant to provide a postmodern and constructivist learning environment in which participants can practice intellectual skills.

Does the students level of computer skills make a difference with how successfully the student can navigate the program. Conversely, will the program maintain the attention of sophisticated users? By the fifth grade many students are playing very sophisticated computer games. Is the age level appropriate to the technology developed?

Design

The design will be centered around and evaluated according to standards set forth by Alessi and Trollip (2001). A & T defined the following standards for evaluation of
Subject matter

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Perhaps rather than enumerating every one of the components of each standard you would be better off briefly describing the standard then comprehensively discussing how your project was designed to comply with the requirement.
**Auxiliary information**

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Development

In progress – See following “storyboard” section. The story will be developed before a final programming choice is made (html or authorware). The final IF piece(s) will be either Internet-based or output on CD(s).

Implementation

The design of this research is quasi-experimental/qualitative due to the developmental nature. During Implementation, the interactive fiction will alpha-tested by peers. This peer evaluation will use the following table developed by Alessi and Trollip as a tool.

**EVALUATION FORM** (Copyright © 2000 by Steve Alessi and Stan Trollip)

Program: ______________ Reviewer: _______________ Date: __________

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ACCEPTABLE</th>
<th>NEEDS WORK</th>
<th>COMMENTS</th>
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<th>Affective Considerations</th>
<th>ACCEPT ABLE</th>
<th>NEEDS WORK</th>
<th>COMMENTS</th>
</tr>
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<tbody>
<tr>
<td>Motivation</td>
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<tr>
<th>Interface</th>
<th>ACCEPT ABLE</th>
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<th>COMMENTS</th>
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<td>Presentation Modes</td>
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<td>Animation &amp; Graphics</td>
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<td>Spacing</td>
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<thead>
<tr>
<th>Navigation</th>
<th>ACCEPT ABLE</th>
<th>NEEDS WORK</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigation Aids</td>
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<td>Consistency</td>
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<tr>
<td>Restarting</td>
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<td>Bookmarking</td>
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<table>
<thead>
<tr>
<th>Pedagogy</th>
<th>ACCEPT ABLE</th>
<th>NEEDS WORK</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>Methodologies</td>
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<tr>
<td>Interactivity</td>
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<tr>
<td>Cognitive capacity</td>
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</tbody>
</table>
Upon IRB approval, the interactive fiction will then be beta-tested by the sample for effectiveness. A T-test will be used to compare two groups. This study will evaluate
learner experience by scoring answers to simple recall questions of content. Answers will be either entirely correct or entirely incorrect. The sample size will consist of approximately 20 children. This will be equivalent to one school class. Sampling from one class will allow a common opportunity of time to run the study. A low sample number has been selected due to the observational complexities and time involved in research. The children should be at least 9 years of age so that reading skills are already established. These scores will serve as the dependent variables. The independent variables consist of two book editions. One book (book A) edition will have a linear text story. The other book (book B) will contain the same story told in a non-linear form with an alterable path determined by learner interaction. Both books will tell the same story and have the same illustrations. While Book A will merely require page turning, Book B (interactive fiction) will require the learner to make judgments. These judgments will determine what happens with the action of the protagonist. Both versions of the fictional story will be on CD-Rom or the Internet for economical purposes.

The sample will be randomly broken up into two groups of students (groups A and B). Group A will receive book A (a linear version of the interactive fiction story). Group B will receive book B (interactive fiction). After the students have read and/or interacted with the book, they will receive an evaluation form consisting of recall questions. The instrumentation will be paper based. I will design a series of questions upon which assessment of recall will be made. The questions are a tool that I will need to develop upon further experience.

Evaluation
The first data collection method will include a peer evaluation session. There will be approximately 5 participants sampled. A checklist will be used to gather data. The checklist will be based upon the Alessi and Trollip’s standards for development that were used in the design phase and will assess the following categories: subject matter, auxiliary information, affective considerations, interface, navigation, pedagogy, invisible features, robustness and supplementary materials.

The second data collection method will include a simple T-test comparing two sample groups. One group will work through interactive fiction story. The other group will read the same story in a linear fashion. Both groups will be given questions that evaluate content recall in each case. The evaluation of recall will be used to show the effectiveness of interactive fiction.

<table>
<thead>
<tr>
<th>Storyboard #10</th>
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<tbody>
<tr>
<td><strong>Image:</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Rough Text Idea:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mole sat in the corner and shelled two piles of nuts. He then packed the nuts into a small pouch inside his fur. Mole continued scraping dirt, a chore he had been performing all the day in his underground home. He was expanding the side tunnel that would lead him underneath the ground toward the meadow.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Branching</th>
</tr>
</thead>
<tbody>
<tr>
<td>To 20</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Storyboard #20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Image:</strong></td>
</tr>
</tbody>
</table>
Rough Text Idea:
Upon reaching the meadow, he will begin his long journey toward the home of his friend. His friend, Squirrel, has had a bad season of collecting nuts. As winter approaches, Squirrel will be in trouble unless Mole can reach him with the packet of nuts. It is up to you, assuming the role of Mole, to reach Squirrel.

**Branching**

<table>
<thead>
<tr>
<th>To 30</th>
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<tbody>
<tr>
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</table>

**Storyboard #30**

**Image:**

Rough Text Idea:
There are three potential problems along the way.

1. The biggest problem will be the weasels. The weasels live in a castle amongst the overgrown grass. They are always on the lookout for critters to capture. The weasels have been known to throw their prisoners into the laundry room of the castle, where the prisoners will remain to do the weasels’ dirty laundry.

2. Mole cannot swim. He must cross water by bridge, boat or some other vessel.

3. Mole only has 2 gold coins that must last him the trip to Squirrel's house.
### Branching

To 40

<table>
<thead>
<tr>
<th>Image</th>
<th>Rough Text Idea:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ready? Let's Go! Remember, you are now Mole!…</td>
</tr>
<tr>
<td></td>
<td>Your pointy paws shovel through the dirt, then roots, then the green grass of the meadow. You can see the sunlight through your squinted eyes, and you pluck yourself out of the hole. You then march across the meadow until you come to patches of much overgrown grass.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Branching</th>
<th>To 50</th>
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<tbody>
<tr>
<td></td>
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</table>

### Storyboard #40

<table>
<thead>
<tr>
<th>Image</th>
<th>Rough Text Idea:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>It was well known that bad-mannered weasels lived within these patches. If the weasels were to see or hear you, they would capture you and throw you into the dungeon. The weasels have also been known to build burrows in which to trap weary travelers looking for a place to rest. You take a deep breath and quietly forge ahead into the patches.</td>
</tr>
</tbody>
</table>

### Branching

To 60

<table>
<thead>
<tr>
<th>Image</th>
<th>Rough Text Idea:</th>
</tr>
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<tbody>
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<td></td>
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</table>

### Storyboard #50

<table>
<thead>
<tr>
<th>Image</th>
<th>Rough Text Idea:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

### Branchboard #60
Here is your first encounter! You come upon a toad sitting beside the mud. His name is Toad. Toad sits loudly croaking and flicking out his tongue in effort to catch a juicy fly for dinner. You ponder inviting Toad along, as he could be a good companion. Do you invite Toad?

<table>
<thead>
<tr>
<th>Branching</th>
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</thead>
<tbody>
<tr>
<td>Yes 70</td>
</tr>
<tr>
<td>No 61</td>
</tr>
</tbody>
</table>

You and Toad join paths. It is sometimes difficult for you to keep up with Toad, as Toad is known for making long jumps. The two of you appear upon a patch where it was important to stick together. “There are weasels in this part of the woods,” you whisper to Toad. Toad tries to slow down to your pace, but he soon sees the most appetizing fleet of flies. He bounds toward the flies while emitting an echoing “croak.” The croak of Toad is enough to alert the weasels of your presence. The weasels scurry toward you, and Toad leaps away.

<table>
<thead>
<tr>
<th>Branching</th>
</tr>
</thead>
<tbody>
<tr>
<td>To 80</td>
</tr>
</tbody>
</table>

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### Rough Text Idea:

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<tbody>
<tr>
<td>Yes 70</td>
</tr>
<tr>
<td>No 61</td>
</tr>
</tbody>
</table>

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**Rough Text Idea:**
You leave Toad to his dining pleasure and continue on alone. This is a wise decision. Toad’s croaking could be heard by the weasels. You shuffle your feet quietly so as not to be heard.

But it is not that simple… As it turns out, Toad is very lonely. He had hoped that you would take him along. Toad is so upset, he cries and bellows as he chases after you. The weasels hear Toad’s sobs and see you on the way.

<table>
<thead>
<tr>
<th>Branching</th>
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<tbody>
<tr>
<td>To 80</td>
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</tbody>
</table>

**Storyboard #80**
**Image:**

<table>
<thead>
<tr>
<th>Rough Text Idea:</th>
</tr>
</thead>
<tbody>
<tr>
<td>You are captured by the weasels!</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Branching</th>
</tr>
</thead>
<tbody>
<tr>
<td>To 90</td>
</tr>
</tbody>
</table>

**Storyboard #90**
**Image:**
The weasels throw you into a musty laundry cell atop their large wooden castle. You know that you must escape. You see two potential routes. You could slide down the laundry chute on the west side of the castle, dig through the ground and tunnel away from the castle. Your second option is to make a rope ladder from the weasels socks that had been left in the cell, climb out the window on the east side of the castle, down the ladder, and wade across a small moat to the grass on the other side.

**Branching**

<table>
<thead>
<tr>
<th>To100</th>
</tr>
</thead>
</table>

Storyboard #100

Image:

![Image](image_url)

**Rough Text Idea:**

Here are the potential problems. If you leave the castle on the west, you do not know exactly where you will end up or if the ground is soft enough to dig through. If you leave the castle on the east, the water may not be shallow enough for you to wade across. Remember, you can not swim. Also, moats have been known to contain alligators. Do you exit west (down the laundry chute) or east (out the window on a rope ladder)?

**Branching**

<table>
<thead>
<tr>
<th>West 110</th>
</tr>
</thead>
<tbody>
<tr>
<td>East 120</td>
</tr>
</tbody>
</table>

Storyboard #110

Image:

![Image](image_url)

**Rough Text Idea:**
West. You slide down the laundry chute and find yourself in the basement of the castle. You can not use the door because it only leads back into the castle. You need to make a hole in the wall to escape. There are several tools in the basement. Which tool should you use? (hammer, screwdriver, axe)

<table>
<thead>
<tr>
<th>Branching</th>
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<tbody>
<tr>
<td>To 130</td>
</tr>
</tbody>
</table>

Storyboard #120

<table>
<thead>
<tr>
<th>Image:</th>
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</thead>
<tbody>
<tr>
<td><img src="image120.jpg" alt="Image" /></td>
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</tbody>
</table>

Rough Text Idea:

East. You land on an alligator’s back. Luckily, the gator is friendly and he gives you a ride to the grass on the other side of the moat. You have reached the river where there is a boat dock and a small raft.

<table>
<thead>
<tr>
<th>Branching</th>
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<tbody>
<tr>
<td>To 121</td>
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</table>

Storyboard #121

<table>
<thead>
<tr>
<th>Image:</th>
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</thead>
<tbody>
<tr>
<td><img src="image121.jpg" alt="Image" /></td>
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</tbody>
</table>

Rough Text Idea:
You climb aboard the raft and push yourself slightly away from the land. Just as you reach over to paddle, you hear some gurgling. You look down to see the raft filling quickly with water. You jump out and struggle back to shore. Luckily, you were not far from land. Unluckily, you see the weasels coming for you!

<table>
<thead>
<tr>
<th>Branching</th>
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<tbody>
<tr>
<td>To 80</td>
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</table>

**Storyboard #130**

**Image:**

![Image](image_url)

**Rough Text Idea:**

Yes! You chose the axe. You axe through the wall and tunnel through the dirt away from the castle. Your claws began to chip as you dig harshly against the gravel. You persist and your hard work pays off. You see the light above the ground, and you pop your pointy little face through the dirt. You have escaped!

<table>
<thead>
<tr>
<th>Branching</th>
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<tbody>
<tr>
<td>To 135</td>
</tr>
</tbody>
</table>

**Storyboard #135**

**Image:**

![Image](image_url)

**Rough Text Idea:**
After pulling yourself above ground, you find yourself at the bank of the river. There is a bridge, and a mule-led carriage takes you across. The carriage stops at the end of the bridge. You exit the carriage and see a forest ahead.

### Branching

<table>
<thead>
<tr>
<th>To 140</th>
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</tbody>
</table>

### Storyboard #140

#### Image:

![Cottage Image](image)

#### Rough Text Idea:

At this point, you are tired and need a place to rest. You see two options. There is a cottage and a burrow just ahead of you. Do you go to the cottage or the burrow?

### Branching

<table>
<thead>
<tr>
<th>Cottage 150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burrow 141</td>
</tr>
</tbody>
</table>

### Storyboard #141

#### Image:

![Weasels Image](image)

#### Rough Text Idea:

It is a trap! The weasels were hiding out in the burrow.

### Branching

<table>
<thead>
<tr>
<th>To 80</th>
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<tbody>
<tr>
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</tbody>
</table>

### Storyboard #150
**Rough Text Idea:**
Good choice. This is the home of Toad's cousin, TC. He welcomes you into his home and serves tea for two. TC warns you of the marsh crossing ahead. You will need to ask a duck to guide you through the marsh. There are two guide-ducks. Only one of them actually knows the way through the marsh. The other duck is not to be trusted. Unfortunately, TC cannot remember which one is which. Nonetheless, this is still useful information. You have rested and are now ready to return to your journey.

**Branching**

<table>
<thead>
<tr>
<th>To 160</th>
</tr>
</thead>
</table>

**Storyboard #160**

**Image:**

**Rough Text Idea:**
You leave TC’s warm home and continue toward the marsh. Upon reaching the marsh, you meet the two guide ducks. They simply refer to themselves as Duck #1 and Duck #2. Both ducks look and act alike. They might even be twins. Each duck offers to take you across the Marsh for the price of one gold coin. You know that only one of these ducks can be trusted, but you have no way of telling the two ducks apart. Which duck do you choose to take you through the Marsh?

**Branching**

<table>
<thead>
<tr>
<th>Duck#1 170</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duck#2 161</td>
</tr>
</tbody>
</table>

**Storyboard #161**

**Image:**
Rough Text Idea:
You pay Duck #2 with one gold coin. Oops! This duck does not know his way through the marsh. He continues to swim in circles near the bank. You finally insist that he return to you to the other duck.

Branching
To 171

Storyboard #170
Image:

Rough Text Idea:
Good choice! Duck #1 knows his way through the marsh. You pay him with one gold coin, and he swiftly takes you across the marsh. You are getting much closer to Squirrel’s house. After you cross the next bridge, you will be there. But will anything block your way?

Branching
To 180

Storyboard #171
Image:
Rough Text Idea:
You are returned to the marsh bank. This time you choose the other duck, Duck #1. You pay him with your other gold coin, and he swiftly takes you across the marsh. You are getting much closer to Squirrel’s house. After you cross the next bridge, you will be there. But will anything block your way?

Branching

To 181

Storyboard #180

Image:

Rough Text Idea:
Oh no! It's the three-toed monkey-troll! He lives under the bridge. There are only two conditions under which he will let you cross the bridge. One option is to pay him one gold coin. The other option is to correctly answer one of his riddles. Do you want to pay one gold coin or answer a riddle?

Branching

Pay 190
Riddle 200

Storyboard #181 (out of money)

Image:

Rough Text Idea:
Oh no! It's the three-toed monkey-troll! He lives under the bridge. There are only two
conditions under which he will let you cross the bridge. One option is to pay him one gold coin. The other option is to correctly answer one of his riddles. Unfortunately, you are out of gold coins. Your only chance is to answer his riddle!

**Storyboard #190**

**Image:**

**Rough Text Idea:**
The monkey-troll thanks you for your payment and steps aside. You may now cross the bridge.

**Branching**

To 200

**Storyboard #200**

**Image:**

**Rough Text Idea:**
Click the "riddle" button below to answer the monkey-troll's riddle. If you answer correctly, he'll let you cross the bridge. If you don't answer correctly, he might be nice and give you another riddle to answer. Good luck!

**Branching**

Correct 220
Not correct 210

**Storyboard #210**

**Image:**
**Rough Text Idea:**
Ah, the monkey-troll must be in a good mood today. He is giving you a second chance to answer a riddle. Good luck! (By the way, the last answer was…).

<table>
<thead>
<tr>
<th>Branching</th>
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</thead>
<tbody>
<tr>
<td>Correct 220</td>
</tr>
<tr>
<td>Not correct 211</td>
</tr>
</tbody>
</table>

**Storyboard #211**

**Image:**

**Rough Text Idea:**
The monkey-troll must really like you. This is your third chance to answer a riddle. Good luck! (By the way, the last answer was…).

<table>
<thead>
<tr>
<th>Branching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct 220</td>
</tr>
<tr>
<td>Not correct 212</td>
</tr>
</tbody>
</table>

**Storyboard #212**

**Image:**

**Rough Text Idea:**
The monkey-troll really wants to see you get across that bridge. He's giving you a fourth chance to answer a riddle. Good luck! (By the way, the last answer was…).
<table>
<thead>
<tr>
<th><strong>Branching</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct 220</td>
</tr>
<tr>
<td>Not correct 213</td>
</tr>
</tbody>
</table>

**Storyboard #213**

**Image:**

**Rough Text Idea:**
The monkey-troll is almost out of riddles. If you don't get this one, he may have to start repeating himself. Good luck! (By the way, the last answer was…).

<table>
<thead>
<tr>
<th><strong>Branching</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct 220</td>
</tr>
<tr>
<td>Not Correct 200</td>
</tr>
</tbody>
</table>

**Storyboard #220**

**Image:**

**Rough Text Idea:**
The monkey-troll is most impressed that you answered his riddle. He nods his head then steps aside. You may now cross the bridge.

<table>
<thead>
<tr>
<th><strong>Branching</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>To 230</td>
</tr>
</tbody>
</table>

**Storyboard #230**

**Image:**
Congratulations! You’ve made it to Squirrel’s house with the packet of nuts! Squirrel is gladly waiting in the window for you.

**Branching**

To 240

---

**Storyboard #240**

**Image:**

![Squirrel image]

**Rough Text Idea:**

Squirrel thanks you!!! (The End)

**Branching**
References:


Frear, V. & Hirschbuhl, J.J. (1999). Does interactive multimedia promote achievement and higher level thinking skills for today’s science students? British Journal of Educational Technology 30no4 323-9


Yeaman et al.


Reeves, T. (2000). Enhancing the worth of instructional technology research through 'design experiments' and other development research strategies. [Online] Available


