

StorytellAR

Supporting Creative Thinking in Storytelling
with Augmented Reality

MBEYBOKU-BOOK



Problem

- Resistance towards storytelling
 - Lack of motivation
 - Lack of inspiration
- Previous attempts to address this have several drawbacks
 - Limit creativity
 - Not very accessible

Theoretical foundation

Sociocultural Theory of Cognitive Development

Collaboration with peers

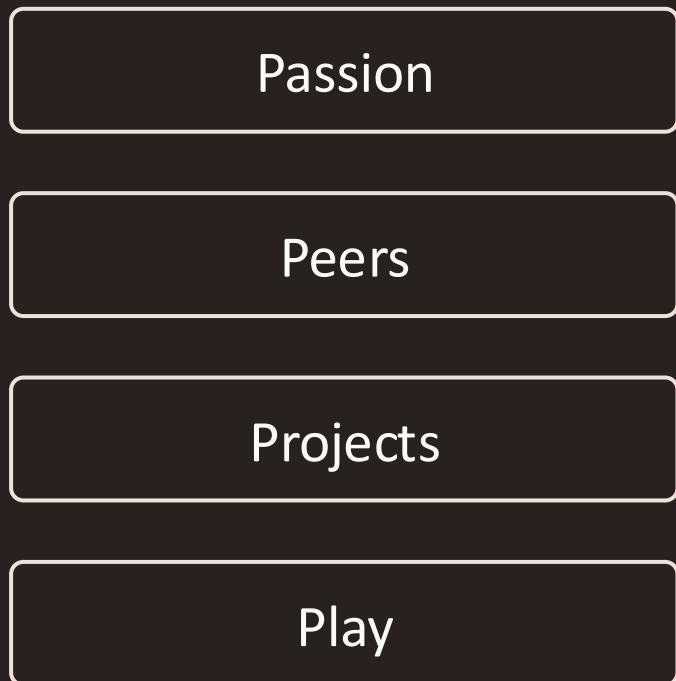
Embodied cognition

Sensorimotor interaction

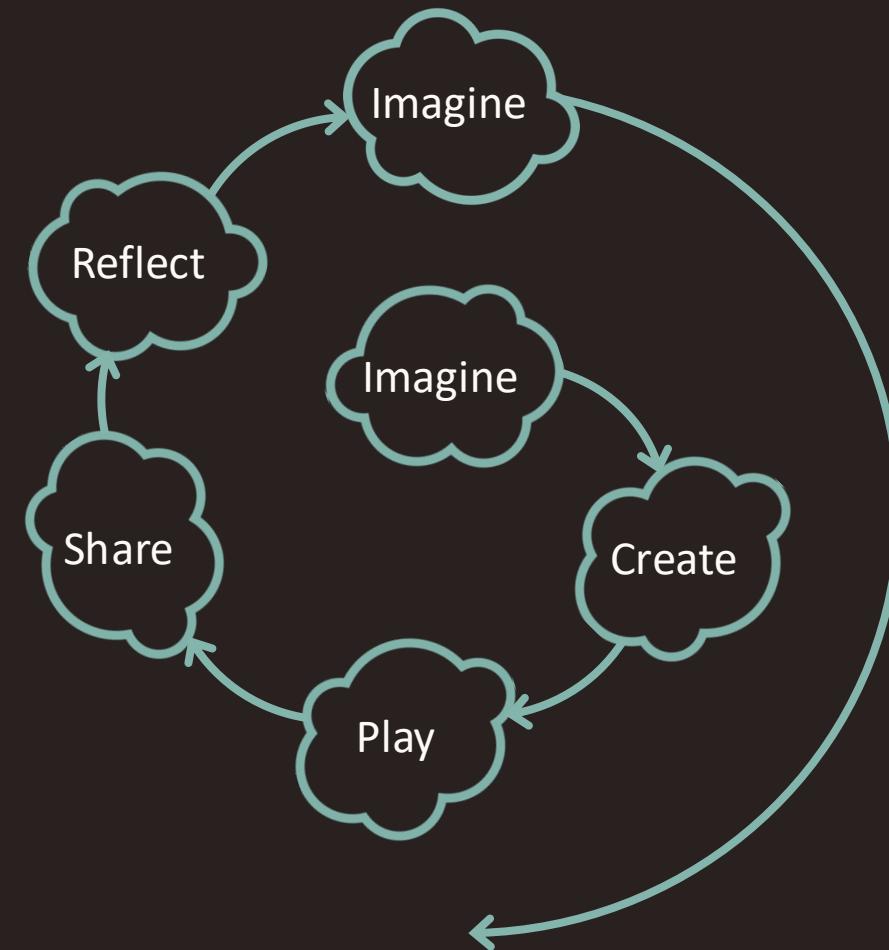
Constructionism

Creation of personally meaningful products

Four P's of Creative Learning



The Creative Learning Spiral



Objectives



Encourage creative thinking



Promote collaboration



Provide inspiration



Motivate participation in
storytelling activities

Related Work

Digital narratives

Location-aware
narratives

Tangible
interfaces

Augmented
reality

- Structured narratives
 - Follows school curriculum
- Unstructured narratives
 - No restrictions
 - Freedom to experiment



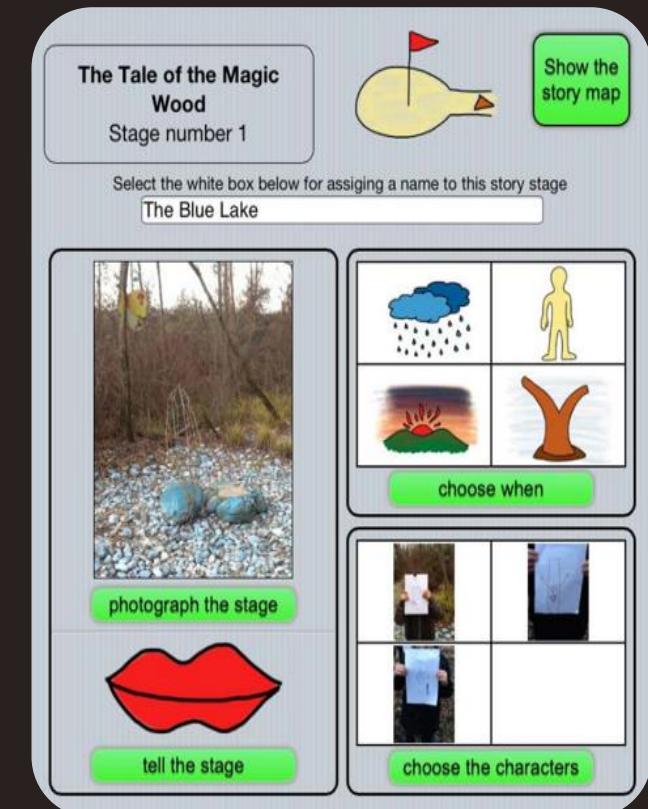
Digital narratives

Location-aware
narratives

Tangible
interfaces

Augmented
reality

- Set in specific locations
 - Inspiration from environment
 - Need to be at location to view story



Digital narratives

Location-aware
narratives

Tangible
interfaces

Augmented
reality

- Interaction through physical objects
 - Embodiment
 - Requires owning single-purpose objects



Digital narratives

Location-aware
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Tangible
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Augmented
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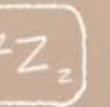
- Inspiration from environment
- Inclusion of media and physical elements
 - In real time
- Embodied interaction



StorytellAR

StorytellAR

- Mobile story creation application
- Stories = videos
- Simple interaction

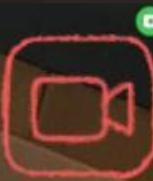
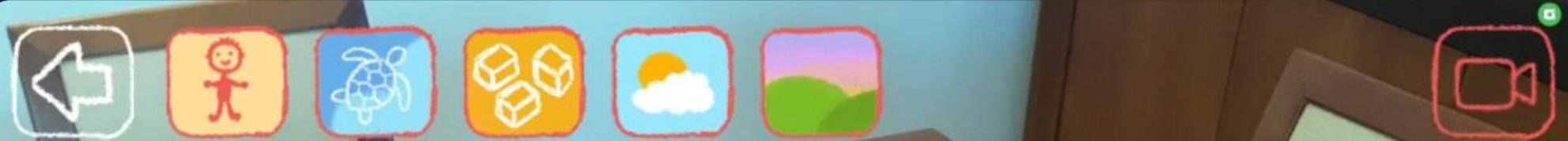


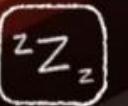












Event
“Activate wind after 1s”



Element properties
(position)

Camera properties
(position, rotation, FOV)

} Frame
Every 0.15s

Evaluation

User study

- 15 participants -> six pairs, one trio
- 4th-grade children (9 to 11 years old)
- Create a story together using the system
 1. Demo video and explanation of the task
 2. Group sessions in the school library
- Evaluation based on:
 - Stories created
 - Session recordings
 - Semi-structured interviews
 - Paper Ladder comparative scale





M&B=YB'U

StoryMaker

Results and Discussion

- Evaluation based on:
 - Stories created
 - Session recordings
 - Semi-structured interviews
 - Paper Ladder comparative scale

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- Stories created
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Thematic analysis

Freedom and Agency

Control over story elements

Embodied Interaction

Embodying characters and physically moving

AR Experience

Incorporating surroundings, opinions and issues

Artistic Expression

Wanting stories to be visually appealing

Culture and Knowledge

References to locations and natural phenomena

UI Concerns

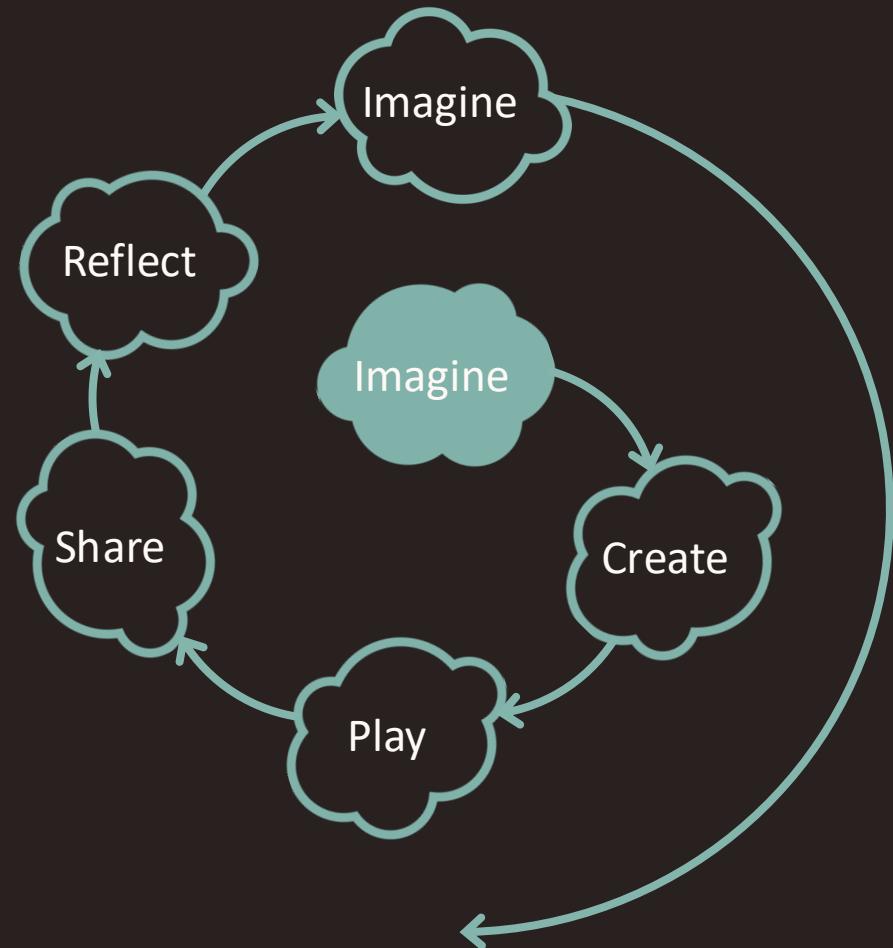
Design issues

Research questions

- RQ1: Does the solution promote creative thinking?
- RQ2: Does the solution promote real-time collaboration?
- RQ3: How often and in what ways do children make use of their surroundings in the stories?
- RQ4: Does the solution increase willingness to engage in storytelling activities?

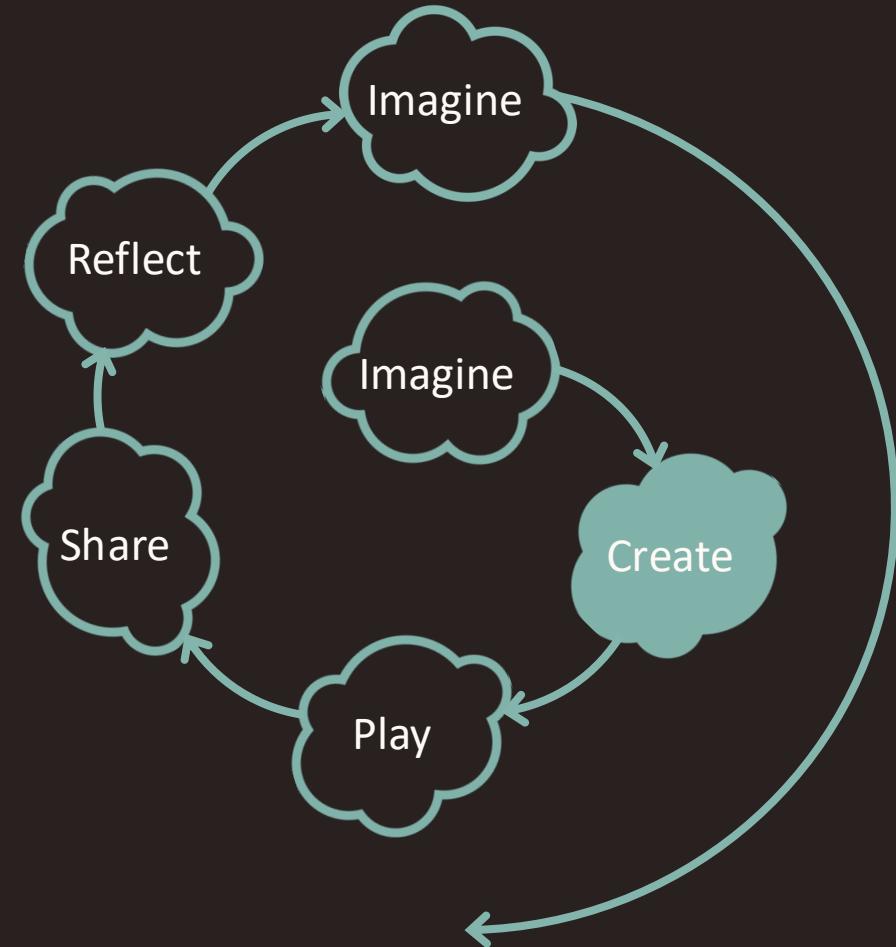
RQ1: Does the solution promote creative thinking?

- a) Does not constrain the stories



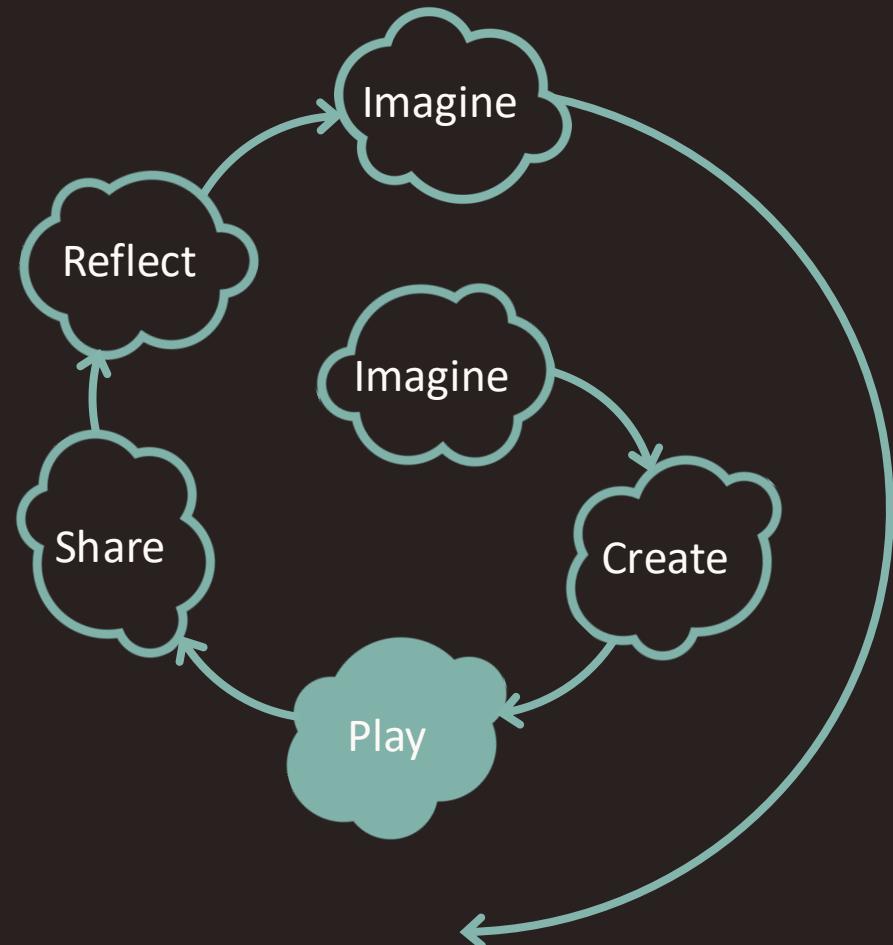
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- a) Does not constrain the stories
- b) Leads to the generation of creative artifacts



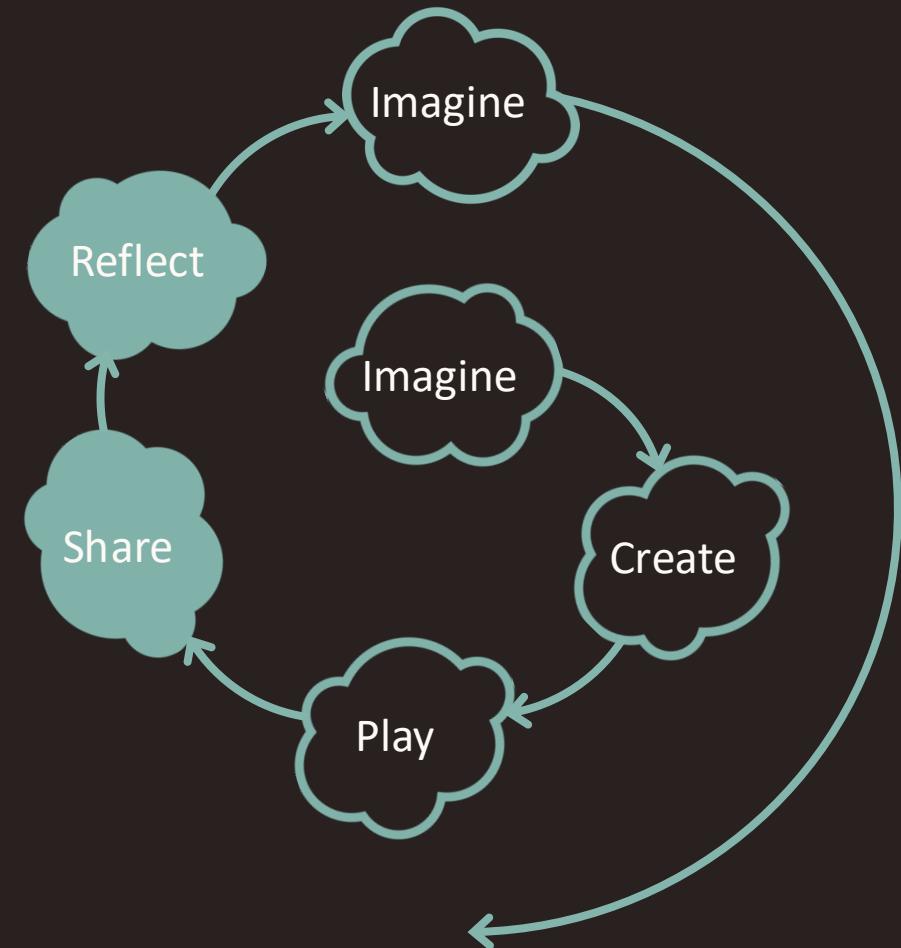
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- c) Facilitates experimentation



RQ1: Does the solution promote creative thinking?

- a) Does not constrain the stories
- b) Leads to the generation of creative artifacts
- c) Facilitates experimentation
- d) Encourages reflecting on past work and sharing it



a) Does not constrain the stories

- Limitations addressed with control over virtual elements
 - Repurposing elements
 - Interactions with landscape objects
 - Would like feedback from them
- Wanted even further agency
 - Customizing landscapes

Freedom and Agency



b) Leads to the generation of creative artifacts

- Virtual elements inspired story themes
- Stories expressed in various formats
 - Narration, dialogue, silence
- Embellished stories with details
- Preoccupation with visual appearance

Artistic
Expression



c) Facilitates experimentation

- Possible, but not ideal
- Took too long to perform some actions
 - E.g. switching landscapes
- Resized elements accidentally
- Sometimes lost characters after moving
- Not possible to pause recording
 - Had to think in advance

AR Experience

UI Concerns



d) Encourages reflection and sharing

- Possible to view stories
 - At least two groups wanted to do so
 - One group edited their story
- Possible to share stories in person or by manually recording the screen



RQ1: Does the solution promote creative thinking?

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- b) Leads to the generation of creative artifacts
- c) Facilitates experimentation
- a) Encourages reflecting on past work and sharing it



RQ2: Does the solution promote real-time collaboration?

- Mostly equal participation
- Discussed ideas and visualized them with the system
- All but one preferred working together
 - More fun
 - More ideas



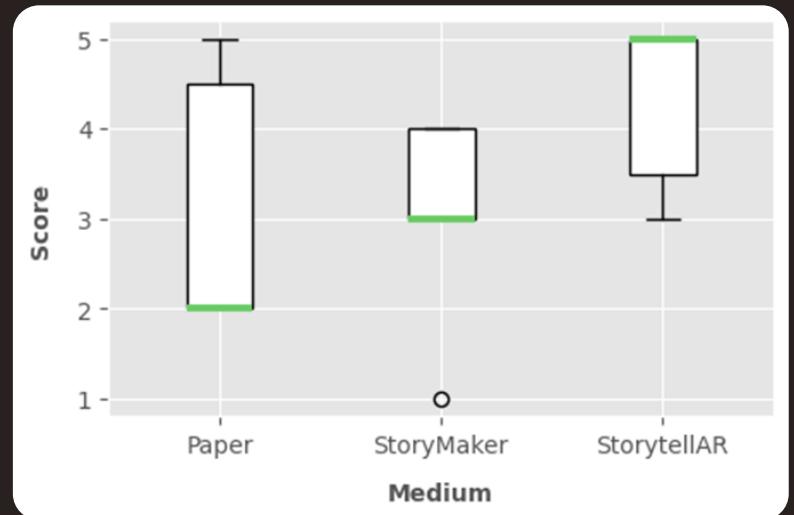
RQ3: How often and in what ways do children make use of their surroundings in the stories?

- Environment not incorporated
 - Even hidden - 9 times
- AR caused several problems
 - Plane detection
- However, it was the primary source of interest

AR Experience

RQ4: Does the solution increase willingness to engage in storytelling activities?

- Prefer using a tablet
- All showed signs of engagement
- Particularly enjoyed viewing the landscapes and moving to explore them



AR Experience

Embodied
Interaction



Educational impact

- Mentioned cultures and locations
- Exchanged knowledge
- Could be a tool for learning about different topics

Culture and Knowledge



“ They were at the Pyramids of Giza!



Conclusion



Encouraged creative thinking



Promoted collaboration



Provided inspiration



Motivated participation in
storytelling activities

Environment wasn't included in the stories

Agency had a high importance

Potential for other knowledge acquisition