STEAMING THE SHIPS FOR THE GREAT VOYAGE
啟帆大航海

AMSTERDAM (1749)

STRUCTURES AND SPACE ARRANGEMENTS OF THE SHIPS

COMPASS, WEAPON, CHINA

TRADING IN THE AGE OF DISCOVERY

PRESENT AND PAST OF ZEELANDIA
Children’s games are as serious as adults’ activities

Games should be respected, protected, supported, and promoted.

Games are public sports, thinking tanks, life cores.

Multiplicity of communications and complexity of mind strategies

Creation of environment with human interactions

Multi-cultural and parental involvements.
SOCIAL COGNITION

• Perception
• Understanding
• Implementation
  • Emotional
  • Interpersonal information

SITUATED LEARNING

• situated in a specific context
• embedded within a particular social and physical environment.

CONSTRUCTIVISM

• humans construct knowledge and meaning from their experiences

GOALS

Sitting \rightarrow Interaction
Reading \rightarrow Participation
Listening \rightarrow Exploration
Thinking \rightarrow Construction

C-FORMOSA

• NISE learning modes
  • Narrative
  • Investigative
  • Strategic
  • Explorative

• Multimedia complex board games
• Emphasize human interactions

FRAGRANCE CHANNEL

香料航道
**GAME CARDS**

- Country
- Hull
- Oar
- Mast
- Weapon

**SHIP PROPERTIES**

- 7 properties
  - Propulsion Power
  - Cargo Capacity
  - Deceleration
  - Firing Distance
  - Arm Power
  - Sailing Force
  - Country

**BATTLE FIELDS**

Programming to mobilize the Robot Ships
CURRICULUM PLAN

STEAM WITH COMPUTATIONAL THINKING

- Unplugged Coding
- Coding with Block Editor
- Coding for Robots
- Making the Robot Ships
- Maker Game

10°
**MULTIMODAL GAMING ANALYTICS SCHEME**

**PERSONALITY TRAIT TEST**
- PERSONAL DYNAMETRIC PROFILE
- 4 Peacocks, 2 Koala, 2 Owls, 9 Chameleon, 0 Tiger

<table>
<thead>
<tr>
<th>Game Session</th>
<th>Player A</th>
<th>Player B</th>
<th>Player C</th>
<th>Player D</th>
</tr>
</thead>
<tbody>
<tr>
<td>814-M-01</td>
<td>Peacock</td>
<td>Chameleon</td>
<td>Koala</td>
<td>Chameleon</td>
</tr>
<tr>
<td>814-M-02</td>
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**GAMING BEHAVIORS ANALYSIS CODES**
- 10 Gaming Behaviors
  - Movement-MO, Attack-AT
  - Inbound (no spice) PW, Inbound (with spice) PN
  - Upgrade weapon-UW, Maintenance-FI
  - Get Spices-GET, Back to Start-BS
  - Outbound-OP, Trade-TR
- 6071 Behavior data from 16 games
- Categorize the data into two stages:
  - Stage 1: Obtain spices from ports self-owned.
  - Stage 2: Obtain spices from ports of others by trade or battle.

**GAMING BEHAVIOR FREQUENCY ANALYSIS**
- To understand gaming behaviors specifically in different student groups.

<table>
<thead>
<tr>
<th>Codes</th>
<th>Stage 1</th>
<th>Stage 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance-FI</td>
<td>0 (0.00%)</td>
<td>2 (0.98%)</td>
</tr>
<tr>
<td>Trade-TR</td>
<td>0 (0.00%)</td>
<td>11 (5.39%)</td>
</tr>
<tr>
<td>Back to Start-BS</td>
<td>6 (7.14%)</td>
<td>3 (1.47%)</td>
</tr>
<tr>
<td>Get Spice-GET</td>
<td>40 (47.62%)</td>
<td>109 (53.43%)</td>
</tr>
<tr>
<td>Inbound (W)-PW</td>
<td>5 (5.95%)</td>
<td>15 (7.35%)</td>
</tr>
<tr>
<td>Inbound (N)-PN</td>
<td>13 (15.48%)</td>
<td>22 (10.78%)</td>
</tr>
<tr>
<td>Outbound-OP</td>
<td>19 (22.62%)</td>
<td>35 (17.16%)</td>
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<tr>
<td>Upgrade Weapon-UW</td>
<td>1 (1.19%)</td>
<td>2 (0.98%)</td>
</tr>
<tr>
<td>Attack-AT</td>
<td>0 (0.00%)</td>
<td>5 (2.45%)</td>
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</tbody>
</table>

**GAMING BEHAVIOR RATIO**

<table>
<thead>
<tr>
<th>Codes</th>
<th>Peacock</th>
<th>Koala</th>
<th>Owl</th>
<th>Chameleon</th>
<th>Girls</th>
<th>Boys</th>
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</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>0.48%</td>
<td>0.48%</td>
<td>0.00%</td>
<td>0.25%</td>
<td>0.25%</td>
<td>0.38%</td>
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<tr>
<td>Stage 2</td>
<td>1.34%</td>
<td>1.29%</td>
<td>1.47%</td>
<td>1.04%</td>
<td>1.31%</td>
<td>1.46%</td>
</tr>
<tr>
<td>Attack Stage 1</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.34%</td>
<td>0.00%</td>
<td>0.23%</td>
</tr>
<tr>
<td>Attack Stage 2</td>
<td>0.79%</td>
<td>1.29%</td>
<td>0.67%</td>
<td>1.54%</td>
<td>0.00%</td>
<td>1.14%</td>
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GAMING BEHAVIOR SEQUENCE ANALYSIS

- Show significant action sequences.
- Differences between stage 1 and stage 2 of Owls.
- More Trading and Maintenance in stage 2, but no attack.

GAMING STRATEGIES ANALYSIS

- What happened? Gaming Behavior
  - Frequency Counts
  - Ratio of Actions
  - Sequence Analysis
- Why did it happen? Gaming Strategies
  - Personality Traits
  - Human Interactions (Oral communication)

INTERACTION CODES

- ICPS: Interpersonal Cognitive Problem-solving Skills
- 12 Strategy Codes adopted from the theory and chosen for games
  - Object transfers
  - Action (help, joint play)
  - Attention and Acknowledgement
  - Instruction and Information
  - Defense (Maintaining a position, or avoiding retribution)
  - ...

INTERACTION FREQUENCY ANALYSIS

Owls
- Stage 1: Neutral conversation, Self-centered planning
- Stage 2: Neutral conversation, Self-centered planning

Peacocks
- Stage 1: Talk, Ask, Share
- Stage 2: Threat, Order, Criticize
ONE PEACE
(OCEAN N' EARTH IN PEACE)

NAVIGATOR
創客奇航

NARRATIVE-BASED GAME

ISSUE-BASED GAME

NAVIGATOR
創客奇航
MAKER-BASED GAME

- Arduino
- mBlock
- APP Inventor

Using diagrams, let learners plan the route of the boat using the mBlock programming language.

Arduino Uno is used along with development boards and components to control boat movement and direction.

A cell phone using Bluetooth can be connected to the boat to control the boat's operation.

APP Inventor is also utilized to develop mobile applications that connect to the boat to control the boat's operation.

HC-06 Bluetooth module is used for communication between the mobile phone and the boat.

STEM TO STEAM PLUS MAKER = INTERDISCIPLINES

• S: Science
• T: Technology
• E: Engineering
• A: Arts
• M: Math
• C: Culture
• H: Humanities
• A: Adventure Ed.
• R: Reading
• M: Maker

Doing one thing that requires knowledge and skills from various subjects.

GUIDE THE KIDS TO SAIL TO THE WORLD

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STEAMING THE SHIPS FOR THE GREAT VOYAGE

Students
Companion
Formation
Operation
Management

Adventure
Observation
Reconstruction

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