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.

CHILDREN'S GAME BY PIETER BRUEGEL THE ELDER (1560)

- 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

DIANA MEMORIAL PLAYGROUND, QUEENSWAY, LONDON (2014)

SOCIAL COGNITION

- Perception
- Understanding
- Implementation
  - Emotional
  - Interpersonal information

SITUATED LEARNING

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

(Jean Lave and Etienne Wenger (1991) Situated Learning. Legitimate peripheral participation, Cambridge: University of Cambridge Press)

CONSTRUCTIVISM

- humans construct knowledge and meaning from their experiences

GOALS

Sitting → Interaction
Reading → Participation
Listening → Exploration
Thinking → Construction

C-FORMOSA

- **NISE learning modes**
  - Narrative
  - Investigative
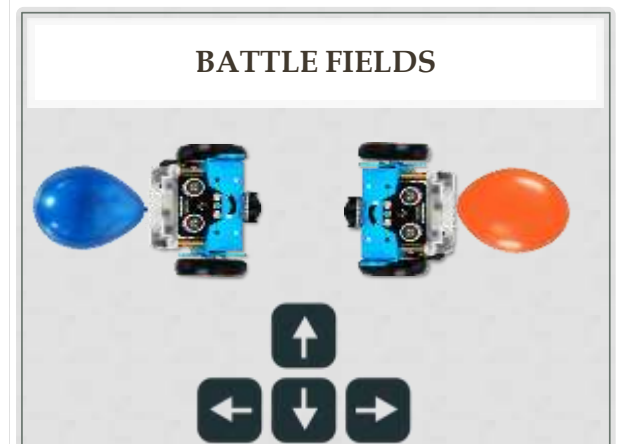 - Strategic
  - Explorative
- Multimedia complex board games
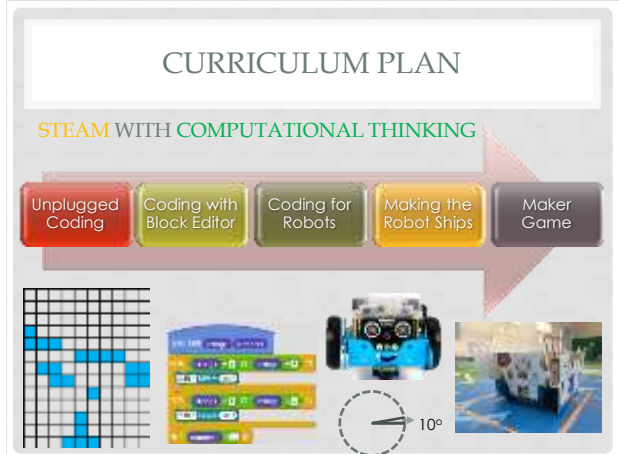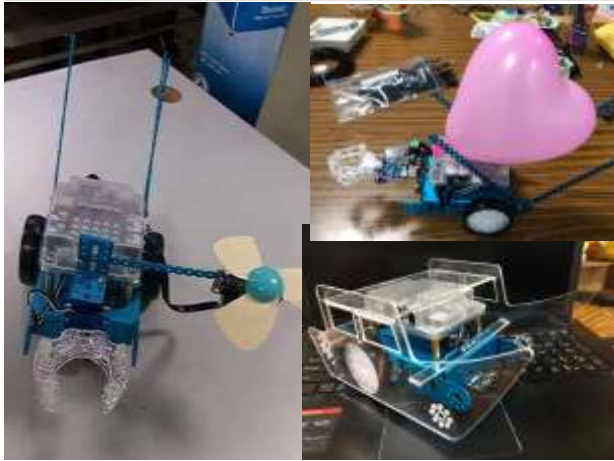- Emphasize human interactions

FRAGRANCE CHANNEL
香料航道

3

FRAGRANCE CHANNEL - MAP

Computer Version

Mobile Version

STEMPort

STEM PORT

史談堡作遊

TASK CARD

6 All

5 From Colonies

2 From Others

Speed+3 Arms & Speed +1

Hull+2 Most Ports

GAME CARDS

Country

Hull

Oar

Mast

Weapon

SHIP PROPERTIES

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

Programming to mobilize the Robot Ships

BATTLE FIELDS

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
多模遊戲分析

PERSONALITY TRAIT TEST

- PERSONAL DYNAMETRIC PROFILE
- 4 Peacocks, 2 Koala, 2 Owls, 9 Chameleon, 0 Tiger

Game Session	Player A	Player B	Player C	Player D
814-M-01	Peacock	Chameleon	Koala	Chameleon
814-M-02	Peacock	Chameleon	Owl	Owl
814-A-01	Peacock	Chameleon	Chameleon	Koala
814-A-02	Peacock	Chameleon	Owl	Peacock
815-M-01	Owl	Chameleon	Chameleon	Chameleon
815-M-02	Peacock	Chameleon	Koala	Chameleon
815-A-01	Peacock	Chameleon	Chameleon	Chameleon
815-A-02	Chameleon	Chameleon	Owl	Koala

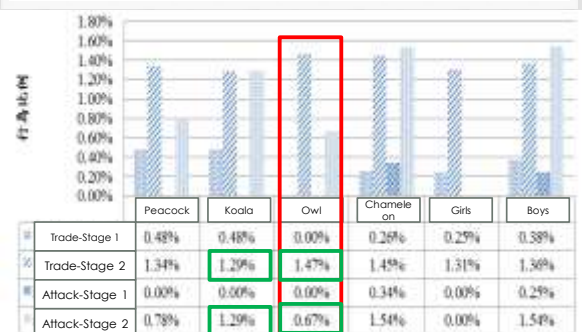
GAMING BEHAVIORS ANALYSIS CODES

- 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.

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

GAMING BEHAVIOR RATIO

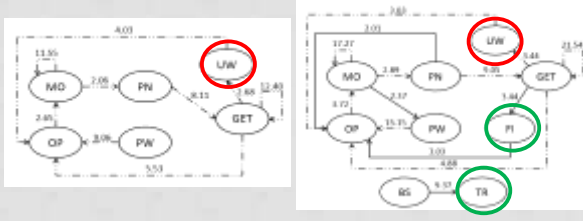|	Peacock	Koala	Owl	Chameleon	Girls	Boys
Trade-Stage 1	0.48%	0.48%	0.00%	0.26%	0.25%	0.38%
Trade-Stage 2	1.34%	1.29%	1.47%	1.45%	1.31%	1.36%
Attack-Stage 1	0.00%	0.00%	0.00%	0.34%	0.00%	0.25%
Attack-Stage 2	0.78%	1.29%	0.67%	1.54%	0.00%	1.54%

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 BEHAVIOR SEQUENCE ANALYSIS

- Show significant action sequences.
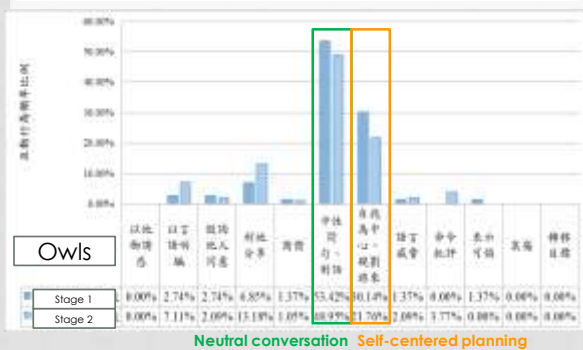- Differences between stage 1 and stage 2 of Koalas.
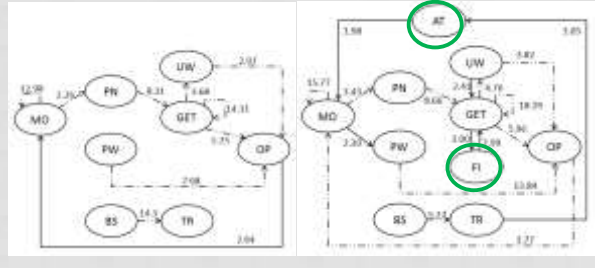
GAMING STRATEGIES ANALYSIS

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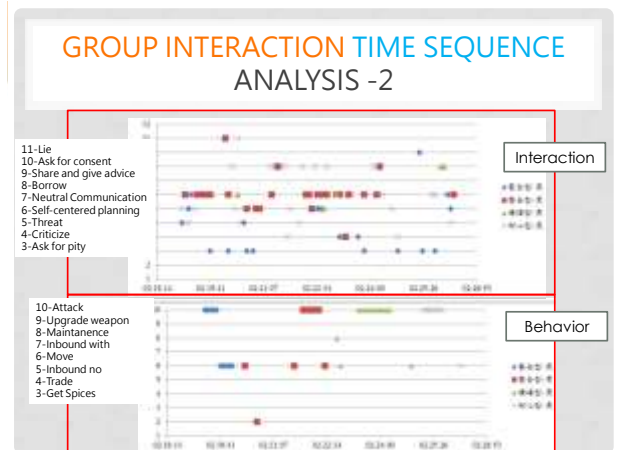   - Human Interactions (Oral communication)
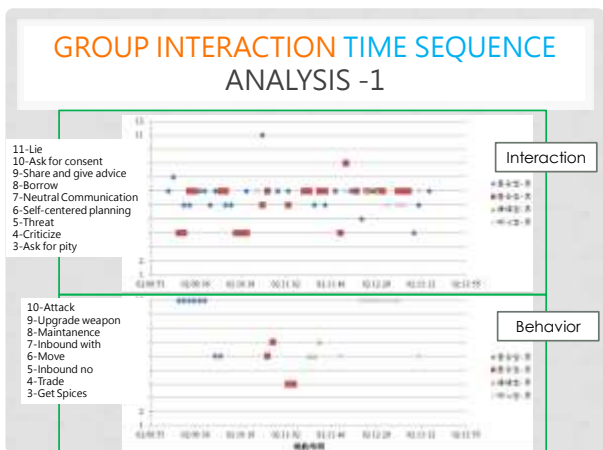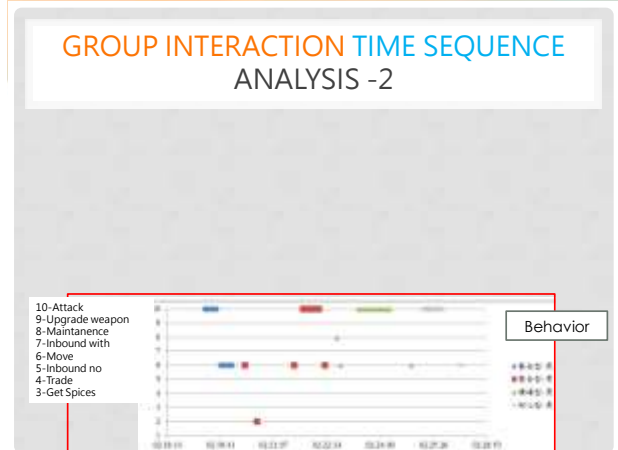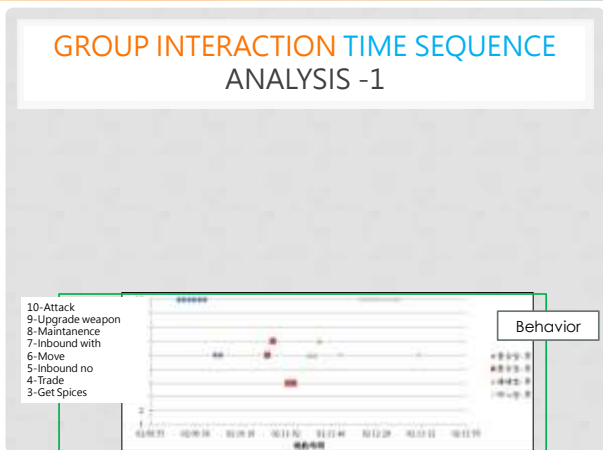
INTERACTION CODES

- 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

Neutral conversation Self-centered planning

INTERACTION FREQUENCY ANALYSIS

Peacocks

Talk, Ask, Share   Threat, Order, Criticize

GROUP INTERACTION TIME SEQUENCE ANALYSIS -1

10-Attack
9-Upgrade weapon
8-Maintanence
7-Inbound with
6-Move
5-Inbound no
4-Trade
3-Get Spices

Behavior

GROUP INTERACTION TIME SEQUENCE ANALYSIS -2

10-Attack
9-Upgrade weapon
8-Maintanence
7-Inbound with
6-Move
5-Inbound no
4-Trade
3-Get Spices

Behavior

GROUP INTERACTION TIME SEQUENCE ANALYSIS -1

11-Lie
10-Ask for consent
9-Share and give advice
8-Borrow
7-Neutral Communication
6-Self-centered planning
5-Threat
4-Criticize
3-Ask for pity

Interaction

10-Attack
9-Upgrade weapon
8-Maintanence
7-Inbound with
6-Move
5-Inbound no
4-Trade
3-Get Spices

Behavior

GROUP INTERACTION TIME SEQUENCE ANALYSIS -2

11-Lie
10-Ask for consent
9-Share and give advice
8-Borrow
7-Neutral Communication
6-Self-centered planning
5-Threat
4-Criticize
3-Ask for pity

Interaction

10-Attack
9-Upgrade weapon
8-Maintanence
7-Inbound with
6-Move
5-Inbound no
4-Trade
3-Get Spices

Behavior

AMSTERDAM

MAST DREAM

桅杆之夢

Mobile Game

Age of Discovery

Taiwan History

Pop-up Map

NFC Chips

Digital Narratives

Mobile Game

NARRATIVE-BASED GAME

ONE PEACE
(OCEAN N' EARTH IN PEACE)
海諧會

ISSUE-BASED GAME

NAVIGATOR
創客奇航
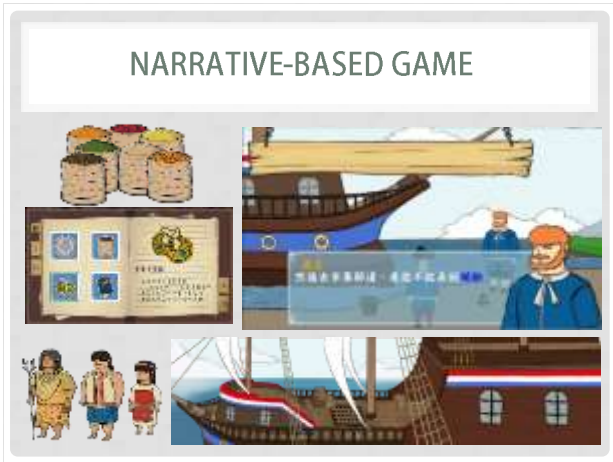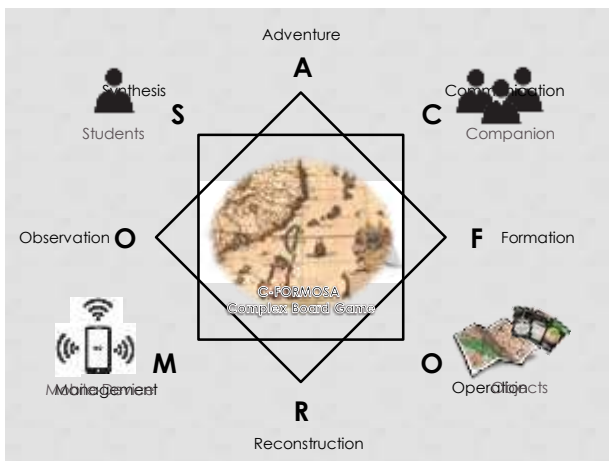
MAKER-BASED GAME

Arduino | **mBlock** | **APP Inventor**
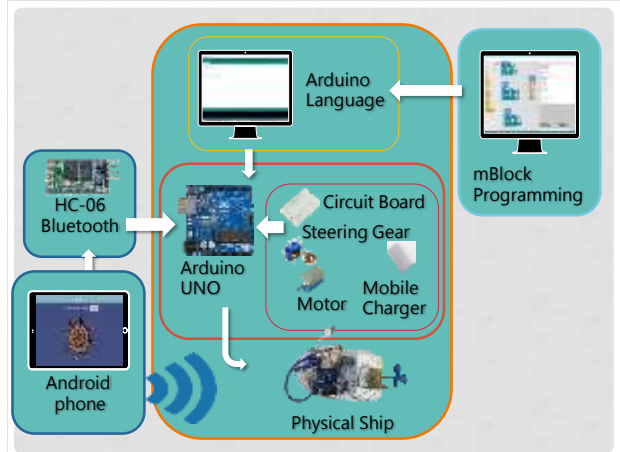
= INTERDISCIPLINES

- 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.

Adventure
A
Synthesis S   Communication C
Students   Companion

Observation O   F Formation

M   O
Management   Operation
Mobile Game   Artifacts

R
Reconstruction

G-FORMOSA
Complex Board Game

STEAMING THE SHIPS
FOR THE GREAT VOYAGE

GUIDE THE KIDS TO SAIL TO THE WORLD

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