Identifying Interaction Design Patterns in Cross-Cultural Computer-Supported Collaborative Interaction

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Overview

- Design Patterns Background
- Design Patterns Identification
- Qualitative Research Approaches
- Research Plan, Setting Data Collection
- Years 1-3 Design Patterns Identification and Articulation
- Design Patterns for Intercultural Collaborative Design Learning
- Cross-Cultural Comparison

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Background: Design Patterns

- Christopher Alexander (1979)
- A pattern is a “good solution to a problem in a certain context.”
- Construction Format Guideline:
  - **Pattern Title:** Uses an inspiring i.e. metaphorical name. + Ranking (***)
  - **Picture:** Illustrates the solution with a visual representation.
  - **Original Context:** Explains the circumstances in which the problem occurs.
  - **Problem:** Describes the problem in this particular context.
  - **Forces:** Gives considerations for contradictory needs to solve this problem.
  - **Solution:** Offers a good solution within this context resolving the before-mentioned forces.
  - **Consequences:** Describes the situation in which the solution is used.
  - **Resulting Context:** Refers to other patterns that can also be used in relation to this solution.

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Collaboration Design Patterns

- Martin et al. [Lancaster Group] (1999-...) Patterns of Cooperative Interaction
  - Artifact as an Audit Trail
- Schuemmer and Lukosch [PloP] (2002-...) Patterns for Computer-Mediated Interaction
  - Virtual Me
  - User Gallery
- Guy (2003-...)
  - Facilitator is Key
  - Email Hyperlink
- Arvola (2004-...). 5 Interaction design patterns for computers in sociable use. For example:
  - Combination of Mobile and Stationary Devices
  - Regulating Prominence

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Design Patterns Identification

- How are design patterns identified and articulated?
  - Experience-based
    - Design solutions that were observed to work well repeatedly in a certain design context and situation
    - Based on long-term work experience within the professional field
    - **UCD**: Observe what works, build interactive system, improve iteratively (Schummer and Lukosch)
  - Ethnographically-informed
    - **Ethnomethodology**: Situated studies of design solutions in computer-supported collaborative interaction (Martin)
    - **Action Research**: Look for Activity patterns for structuring and reporting field observations to inform designs that improve work in this situation (Martin)
    - **Activity Theory**: Structure observations by Activity Theory (Guy)
Qualitative Research Approach

- Ethnographically-informed design patterns identification:

Building Theory

- identification of elements, exploration of connections
- building theory

- research interest in: discovery of regularities

- action research evaluative research
- grounded theory

- deficiency

Practical Exploration/Solution

- discerning of patterns practical exploration and alternative solutions
- educational ethnography
- holistic ethnography

- culture
- ethnography of communication (micro ethnography)

- culture
- interactive
- ethnomethodology
- structural ethnography
Question

- How can design patterns be identified and articulated from the analysis of a situated study of cross-cultural computer-supported collaborative design learning?
Setting

- Undergraduate university design studio subject in collaborative design education
- Over 3 years 5-6 week course
- Organized by the School of Design at the Hong Kong Polytechnic University taught in collaboration with partner universities
- 2-4 second year Hong Kong students and 1-3 international partners from Korea, Taiwan, Austria, and the USA
- Course outline:
Computer Support for Collaboration

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- MSN or ICQ chat systems.
- Server Space and File Sharing Software
- Video-chat software for university-organized joined presentation
- Project Website Blog or Yahoo Groups
- Email
- Shared Documents
Data Types

- Observations and Contextual Interviews
- Expert Interviews
- Log Files of Conversations
- Design Representations
- Design Pattern Workshops
Research Plan

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First Year

Categories: from Observations and Contextual Interviews

- **Technology**: Message Structure, Chat, Presence Indicators, Connection Center, Picture Sharing, White board, Video Conference, Community Space
- **Team Management**: Time, Task, Assignments, Lectures and Tutorials, Misunderstandings, Social Interaction

Categories from Expert Interviews

- Understanding
- Breakdown
- Awareness
- Communication
- Coordination
- Tools

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Second Year

Categories: from Observations and Conversation Analysis

Guide: Categories from year one
Goal: Holistic Understanding

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Second Year

Results: 13 Intermediate Design Patterns

2 **Blended Collaboration:** This solution suggests blending local and remote teamwork activities into one collaborative process.

3 **Community Workshop:** This pattern builds on the previous pattern, recommending the installation a collocated community workshop to start the project, and establish trust among participants through a mix of social and task-related communication.

4 **Community Portal:** The design solution in this pattern advises to setting up a virtual community portal to strengthen the relation of the members in the newly established virtual team and the entire learning community.

5 **Local Team:** This pattern introduces the concept of a local team and suggests how such a team might be set up.

6 **Team Blog Page:** This pattern builds on the above-mentioned solution and suggests show to represent a local team online within the community portal.

... 

13 **Awareness Indicator:** This design pattern suggests conveying information about past activities, present states and possible future events involving members and objects used in the project.

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Second Year

Evaluated with Designers in Design Pattern Workshops

- **Positive**
  - Context descriptions
  - Interrelations among patterns (could be more)
  - Diagram helpful but does not have to be hierarchical
  - Patterns could be used in multiple phases of the design process
  - Support communication among stakeholder

- **Negative**
  - should be aimed at the interaction principle not at the artifact used to implement this solution i.e. e-mail pattern - why is it useful in intercultural contexts?
  - more culturally sensitive descriptions needed and in which cultural context it could be used and in which not
  - where is culture? for which culture? why this solution?

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Third Year

Recoded and analyzed data from one year in-depth using theoretically informed coding scheme

**Intercultural Communication:** (Clark 1993, Gudykunst 1993, Ostwald 1995, Scollon and Scollon 2001)

- **Breakdowns:** Miscommunications and Breakdowns in communication of culturally diverse interlocutors
- **Dealing with Breakdowns:** Approaching miscommunication through becoming aware, communicate consciously, facilitation,...
- **Gain Common Ground:** Reducing or avoiding misunderstanding by gaining shared understanding

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Third Year

Recoded and analyzed data from one year in-depth using theoretically informed coding scheme


- **Awareness**: Distributed collaborators need to be aware what others are doing.
- **Communication**: Conversational mechanism such as communication flow or dealing with breakdowns need to be supported.
- **Coordination**: Collaborative team and individual work needs to be coordinated.
- **Content Management**: Collaboration artifacts need to be stored and shared.
- **Instruction**: In learning contexts, students need to be instructed and facilitated through tutorials and lectures.
- **Implementation**: Especially in design work, ideas need to be implemented in tangible artifacts.
Third Year

Recoded and analyzed data from one year in-depth using theoretically informed coding scheme

Cultural Value Dimensions:

- **Activity Orientation**: Trompanaars’ Ascription vs Achievement (1994), Kluckhons Activity Orientation (1950), Condon and Yousefs’ Supernatural Orientation (1985) and Schwartz’s Achievement Value (2001)
- **Authority Concept**: Victor’s Authority Conception the Power Distance dimension suggested by Hofstede (1997) and Family value proposed by Condon and Yousef (1985), Power and Conformity suggested by Schwartz (2001)
- **Contextual Communication**: High and ow Contextual Communication by Hall (1959) and Victor (1992).
Third Year

Recoded and analyzed data from one year in-depth using theoretically informed coding scheme

Cultural Value Dimensions:


- **Technology Orientation**: Experience of Technology (controlling versus being controlled) by Victor (1992), and Man’s Relation to Nature by Kluckhon (1950)

- **Time Orientation Orientation**: Long or Short Term, Monochromic or Polychromic Time by Hall (1959), Hofstede (1997), Trompanaars (1994), Condon and Yousef (1985)

- **The Uncertainty Avoidance**: Low or High Uncertainty Avoidance by Hofstede (1997)
Third Year

Recoded and analyzed data from one year in-depth using theoretically informed coding scheme

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### Third Year

Co-coding Frequencies used to discover relations among coded observations

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DP 1: GRAND OPENING: A collocated design workshop opening makes international participants aware of the importance of the project, connects them emotionally with the learning community and provides opportunity for first coordination among the distributed teams.

DP 2: COMMUNITY WATCH: Watching activities in an international community online portal supports the awareness and coordination of community relevant information and actions in geographically and culturally dispersed teams.

DP 3: INTERNATIONAL HOME: A virtual group home supports storing, sharing, creating and modifying of design ideas and representations among distributed learning teams.

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DP 4: STRUCTURED CHAT: A structured synchronous computer-mediated discussions keeps the discussion of culturally diverse collaborators focused.

DP 5: SUMMING UP: The generation of frequent summaries of online or local discussions allows the global virtual team to gain a common understanding of the design project process, tasks, ideas and open problems to solve in following conversations.

DP 6: MOOD OF THE MOMENT: Visual communication means such as Emoticons or the formatting of text make culturally diverse interlocutors aware of implicitly mediated information contents with emotional value.

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DP 7: ANNOTATED DESIGN GALLERY: An annotated design gallery supports the sharing and interpretation of locally implemented design variations.

DP 8: WHO WHEN WHAT: Allowing structuring online information by User ID, Date and Time and Content Summary bridges cultural differences in managing online contents.

DP 9: LOCAL VARIATIONS: Implementing local variations of a globally shared design concept and idea facilitates the development of a shared understanding in cross-cultural collaborative design learning.
**DP10: GLOBAL RESOLUTION:**
Synchronous text or video chat tutorials help gaining common ground among culturally diverse distributed learning teams and their local tutors.

**DP11: GRAND FINAL:** Organize a global, virtually mediated final presentation to let the students not only present the design project outcomes but also demonstrate their skills in computer-mediated communication.
"COMMUNITY WATCH" **

Thumbnail
Watching activities in an international community online portal support the awareness and coordination of community relevant information and actions in geographically and culturally dispersed teams.

Cultural Context
Supports Collective Community and Hierarchical Authority Cultures, Bridges High and Low Contextual Communication Cultures

Context
You established a collocated design learning community using the GRAND OPENING design workshop.

Breakdown
Unfortunately, not all international community members could attend the collocated workshop. The visiting international students will have to return to their home country. Awareness about progress in other global virtual teams and activities in the international community would either rely on local inter-team communication or would be lost once the visitors return to their home country.

Problem
How do you support awareness of and active involvement in community activities?

Forces
In a short-term design project, students rarely take time to individually and actively maintain an international online community. However, teams with a collective community orientation tend to consult the community’s views and actions in order to remain in harmony with the community goals and rules. Participants like to watch what other community members do. Moreover, hierarchical cultures expect the authorities to maintain environments in which information about community matters are constantly updated and distributed. If such environment is limited to local ways of distributing information, the feeling of an international community cannot arise or be maintained. Therefore, awareness of online community activities, design project requirements, learning assessment criteria and announcements of news or changes in community issues made by the authorities are valuable information for global virtual teams that should be accessible by everyone anytime.

Solution
Make global teams aware of community relevant information and coordinate community activities through a public accessible online community portal that also allows entry to the individual group homes.

In this public space, design briefs, lecture materials and curricula are made available to all members of the design learning community. The participating universities and design streams are described and represented in this space. A global announcements communication channel is used to publicize changes in curricula or milestones anticipated in the project. In order to facilitate the acceptance and regular use of such a community space, all team traffic is direct through this entrance hall. Allow the access of INTERNATIONAL HOMES of teams via the community space. This not only allows access to the team’s space but also stimulates to monitor what neighboring teams are doing and allows for comparison of the design learning progress.

Why
Collective community cultures develop a shared understanding of the design scope over time by continuously interpreting information provided in the community environment like design briefs, announcements, changes in activity, or other teams’ progress. In collective community cultures, monitoring other teams helps dealing with breakdowns in the design and learning process of one’s own team. The perception of the performance of other teams is basis to evaluate one’s own performance. Design processes can be compared. This also helps high uncertainty avoidance cultures to gain awareness and confidence in accepting a diversity of design and learning processes utilized in the community.

The community hall balances cultural dimensions in which team members might differ. Small amounts of information and hints that raise awareness are balanced with direct messages from instructors, design briefs and lecture materials online. While, community members, who prefer low contextual, direct and neutral communication interpret explicit messages to build a shared understanding, high contextual and affective communicating cultures feel the emergence of a learning atmosphere that encourages further interaction in the online community.

Due to an hierarchical orientation, student feel save and embedded in a community when the authority (group of instructors) demonstrates that every aspect in question is taken care of and changes are announced when relevant to the community, so that every team can pursue their work. Moreover, ascription cultures feel a dedication to the project and the wish for a good collaboration, which is more rewarding to them than the achievement of a perfect final product or good grading.

Resulting Context
Use the pattern READY STEADY GO to introduce this online community to the participants in early stages of the project. Allow each team can access their INTERNATIONAL HOME via this community portal.

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### Cross-cultural Comparison

**Comparative Method:** Truth Tables (Ragin 1992)

- Row 1: Hong Kong Korean teams watched community activities online.
- Row 2 and 4: online community coordination was of little concern for teams of mixed collective community, hierarchical authority and individual community, equal authority oriented cultures.
- Row 2: successful coordination of community online but in a different way.
- Coordination was nearly exclusively handled though daily synchronous communication among Hong Kong and Taiwanese student.
- Students were all present in the design studio, local teams chatted with other remote teams.
- Social network coordination.

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<th>Culture Context</th>
<th>Problem</th>
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Conclusions

‣ Context-dependent identification and articulation of design patterns

‣ Qualitative and comparative analysis of cross-cultural computer-supported collaboration viable

‣ Holistic understanding valuable but also need to know the differences among various intercultural collaboration contexts

‣ Identification: Situated study using ethnographically informed inductive and deductive analysis and mapping methods

‣ Articulation:
  ‣ Deductive analysis: achieve a persistent textual description and structure a design pattern
  ‣ Comparative analysis to evaluate validity of patterns across contexts

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