

# A comparative study of the behavior and evaluation of analog and digital community currency : Research using gaming simulation

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## Introduction

**Community Currency (CC):** Currency limited to distribution within a specific area, Issued by an organization in its own unit

- About 800 CCs were issued in Japan, most of CCs are analog-banknote, analog-LETS
- Recently, new digital CC has increased in Japan (Local Exchange and Trading System)

Table 1: Features of CCs

Category	Issuance form	How to use	Merit	Demerit
Analog	Banknote (paper) type	<ul style="list-style-type: none"> <li>Use as cash</li> </ul>	<ul style="list-style-type: none"> <li>Easy to use</li> </ul>	<ul style="list-style-type: none"> <li>Difficult to manage issued Banknote</li> </ul>
	LETS type	<ul style="list-style-type: none"> <li>Each people has a passbook</li> <li>A debit is recorded in one passbook, income is credited in another passbook</li> <li>The total passbook amount for all people is always zero</li> </ul>	<ul style="list-style-type: none"> <li>Capture transaction histories</li> </ul>	<ul style="list-style-type: none"> <li>Difficult to manage issued passbook</li> <li>Need to explain how to use</li> </ul>
Digital	Reloadable type	<ul style="list-style-type: none"> <li>People use an app</li> <li>Payment can be made using a bar/QR code</li> </ul>	<ul style="list-style-type: none"> <li>Capture transaction histories</li> <li>Analyze large amounts of transaction data</li> </ul>	<ul style="list-style-type: none"> <li>High cost of introduction</li> <li>Problem of security</li> </ul>

Yoshida and Kobayashi (2016)

- Analog-paper CC promotes circulation of CC
- Analog-LETS CC tends to bring community oriented value to users

**We infer and consider economic society where the digital CC is used, building on a gaming simulation where digital CC is used**

## Community Currency Game

**Rules** We adopt Community Currency Game (CCG), face-to-face analog game

- Five roles in the town, and each participant is assigned one role
- The participants must make decisions:
  - Buying items inside or outside the town
  - Whether to volunteer on request
  - Whether to participate in the town activities
- In the first half, participants trade only with yen
- In the second half, participant trade with yen and CC
- Compare participant's behaviour before and after introducing CC

### Implementation

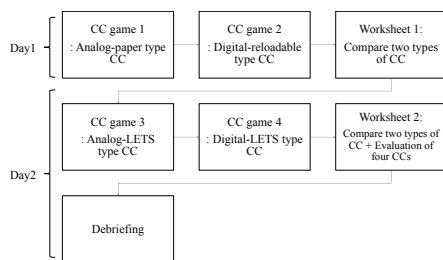


Figure 1: Implementation of the game: four games were played over two days

### Participants

- To avoid the influence of prior CC use experience, we conducted this game for university students who have never used CCs previously.

### Four Games

- We conducted four games with different types of CCs (Figure 1)
- To compare analog and digital, we set the digital-reloadable CC as the digital CC corresponding to analog-paper CC, and set the digital-LETS CC as the digital CC corresponding to analog-LETS CC.
- The participants played two games using analog and digital CCs that corresponded to each other on the same day, and at the end of the day, they evaluated the two CCs.
- At the end of the second day, all participants compared the analog and digital CCs used in the two games and evaluated all four CCs.

**Examining whether changing an analog CC to a digital CC changes the behavior of participants and the evaluation of the CC**

## Results

### Participant's behavior

Table 2: Behavior changes before and after CC introduction

Purchasing in the town ↑ (Digital)  
 Volunteering ↑ (Digital)  
 Town activity ↑ (Analog)

- After introducing analog CC
  - The number of activities in the town significantly increased
- After introducing digital CC
  - the purchase frequency inside the town and volunteering frequency significantly increased

**These experiences in the game are reflected in participant's evaluation of CC**

### Participant's evaluation of CC

Table 3: Comparison of the two CCs

		average	N	SD	t	DF	p
convenience of CC	analog-paper	2.57	14	0.514	-7.87	13	0
	digital-reloadable	3.86	14	0.363			
analog-paper vs digital-reloadable contribution to economic revitalization	analog-paper	2.93	14	0.73	-2.28	13	0.04
	digital-reloadable	3.5	14	0.519			
analog-LETS vs digital-LETS convenience of CC	analog-LETS	2.38	13	0.65	-5.333	12	0
	digital-LETS	3.62	13	0.506			

- Digital CC has a high evaluation in both rounds of comparison regarding convenience and contribution to economic revitalization

Table 4 Ranking of the four CCs

median rank	Revitalization of the local economy	Strengthening the local community ties	CC that should be introduced
1	digital-LETS (1.54)		digital-reloadable (1.69)
2	digital-reloadable (1.92)	analog-LETS (2.08), analog-paper (2.38)	digital-LETS (2.00)
3	analog-LETS (3.08)	digital-reloadable (2.77), digital-LETS (2.77)	analog-LETS (2.92)
4	analog-paper (3.46)		analog-paper (3.38)

shown in parentheses is average rank

- Participants evaluate digital CCs as enhancing the economic effect, analog CCs as bringing community effect
- However, none of the four CCs have clear ranks for 'strengthening local community ties'

**Participants had a strong impression on economic effect of CCs through the games**

## Discussion

**Even if the game structure is the same, participants' behavior and evaluation of CC differs depending on the CC used**

### Reason

- The convenience of CC: The convenience of digital CC encouraged economic transactions and volunteers and led to evaluate digital CC as enhancing economic effect and as CC to be introduced
- These results depend on the characteristics of the participants and the characteristics of the CC used, especially the characteristics of the digital CC application