

Fostering and Reflecting on Diverse Perspective-Taking in Role-Play Utilizing Puppets as the Catalyst Material under CSCL

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Abstract: Role-play is a powerful strategy that helps learners broaden their perspectives in a given subject area through communication. As a vehicle of role-play, puppetry achieves this benefit while creating a psychological distance from the role-player's actual identity, meaning that the player's anxiety or apprehension toward evaluation is reduced. EduceBoard is a tangible system that enables participants to conduct role-play using puppets and foster reflection based on the diverse perspectives of the characters in the role-play. Preliminary evaluation of EduceBoard demonstrated that it allowed participants to play various roles in role-play and helped them reflect on their role-play from a variety of perspectives. In this paper, we also discuss how we can foster successful transfer of what they have learned to their self-performance in role-play or in real-life context.

Keywords: role-play, puppetry, perspective-taking, reflection

Role-play has been researched widely from various perspectives and is still an active topic in CSCL research (Strijbos & De Laat, 2010). Role-play provides a very effective way for students to “dive in” (Resnick & Wilensky, 1997) to a particular situation, and has been established to address a wide range of learning needs from interpersonal or group communication skills to various concepts in history, economics, and sociology (Forsyth, 1999) and science. Participants in role-play learn to adopt another perspective, often that of another person in a simulated situation.

Role-play is a particularly powerful learning strategy in that it involves improvisation, which helps overcome biases through the development of new beliefs (Friedman, 2004). This is because in role-play, participants are sometimes required to behave counter-attitudinally, and the improvisations by which they do so are often based on the role-players' experience and reflections in areas of their daily lives.

However, some participants still cannot play their roles very well due to excessive self-consciousness (Ladrousse, 1989) or evaluation apprehension (Cottrell et al., 1968). For example, microteaching role-play, that is, role-play that trains teachers to engage in communication and decision-making in the classroom, requires participants to play the roles of teacher and young pupils in a realistic way. However, the reactions and feedback provided by student teachers acting as young pupils tend to be unrealistic when they self-perform, especially in that they disproportionally often play honest students who follow the teacher's instructions.

When we consider the matter of providing scaffolding to achieve more realistic role-play, we can be inspired by Holzman (2009)'s ideas about the possibilities of play as imitation in learning, which can elicit an active, creative and fundamentally social process that is essential to creating a zone of proximal development (Vygotsky, 1978). Holzman pointed out that through play, children often imitate what is beyond them in their environment and relationships, and that this enhances their learning. She noted that even adults can learn through play.

Mochizuki et al. (2013) proposed that puppetry can serve as a powerful device for allowing people to overcome emotional or interpersonal obstacles to face-to-face role-play and for eliciting reactions including inner emotions or unconscious experiences that they have had in a problematic situation. Puppetry is a familiar form of play from infancy through adulthood, a fact that helps participants anticipate and prepare for a number of possible, even unusual, roles. The most important function of puppetry in this regard is that it allows each participant to obtain participant-observer balance by creating a clear separation between self (puppeteer) and non-self (puppet) as well as character (puppet) and observer (puppeteer) while playing a puppetry story. Playing a role distinct from one's own personae can encourage social interaction among shy or passive students who normally have trouble learning from or with their peers (Aubusson et al., 1997). The puppet contains recognizable elements of the self that the puppeteer can identify with. Such projection in puppetry provides a

“margin of safety,” a balance between underdistance and overdistance (Aronoff, 2005). Thus, puppetry can facilitate the taking of various perspectives by playing roles that rarely appear in self-performed role-play.

EduceBoard: A tangible puppetry role-play support system

We have previously presented the EduceBoard system (Wakimoto et al., 2013), which is a tangible puppetry-based role-play support system intended to enable users to achieve and dramatize possible insights of various characters in the role-play. The system has two functions: 1) engaging in and recording puppetry-play on the table and 2) playing the recordings online to help participants reflect on their performance and choices.

The system records the actions and conversations of the participants (hereinafter, the “actors”) on top of a glass table (Figure 1 (a)). In Figure 1, photo (a) shows the system when it is ready to implement. Each puppet or prop is attached to a transparent box with an AR marker on the bottom. In addition, there are red and blue LED lights in the box, and each actor can express his or her puppet’s condition by manipulating a switch to change the color of the LED (Figure 1 (b)); for example, in a microteaching role-play, a red LED may represent a sleeping/careless student, and a blue LED an attentive/note-taking student. A web camera and microphone under the table record the puppets’ movements and conversations (i.e., the behavior of the actors), by detecting the AR markers. After the role-play (Figure 1 (c)), the system sends the recorded data to a server; the actors can view it online to inspire reflection (Figure 1 (d)). The webpage displays the role-play in animated form, from a bird’s-eye view; the actors exchange comments in the box at right and reflect further on their conversations and actions.

This presentation reports the results of a preliminary evaluation of EduceBoard, observing whether the actors can concoct an effective improvisational role-play that dramatizes a variety of reactions to the conversation and whether they can then reflect fruitfully on it from a variety of perspectives using the system.

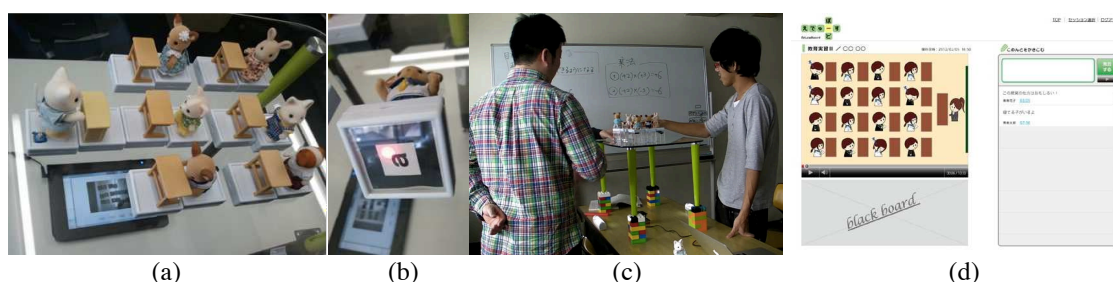


Figure 1. The EduceBoard System

Preliminary evaluation: Methods and analysis

The evaluation was conducted using a microteaching role-play because that is a common means of role-play training useful especially when informal discourse appears during the role-play, and there are many schemes to analyze communication among a teacher and students (see Table 1 below). Six university sophomores majoring in informatics and training to get teaching licenses participated. They formed two triads; each of them played once as a teacher and twice as pupils using puppets. Each puppetry session took 10 minutes; then, students watched the recorded role-plays and gave mutual feedback in the comment box on the webpage. Furthermore, they discussed three sessions based on the feedback while watching the recording, and the feedback appeared alongside the animations. All the discussions were video-recorded and transcribed.

Table 1: Definition of codes for utterances in the role-play simulation of microteaching (Fujie (2000))

Utterances	Definition
Teacher-Formal	A teacher’s utterance that follows his/her lesson plan or is academic related
Teacher-Informal	A teacher’s utterance based on his or her individual experience and reaction to the students
Teacher-Double barreled	A teacher’s utterance reflecting the features of both “formal” and “informal” types
Student-Formal	A student’s utterance that follows the teacher’s instructions or is academic related
Student-Informal	A student’s utterance based on his or her individual experience and intention (not academic)
Student-Double barreled	A student’s utterance reflecting the features of both “formal” and “informal” types

In addition, to examine the impact of puppetry role-play on self-performed role-play, the students conducted self-performed microteaching role-play in the same group after the puppetry. All the self-performed role-plays had the same topics as the puppetry and were video-recorded. After the role-play, students again

watched the videos, and gave mutual feedback on paper. Then they discussed three role-plays based on the feedback. All of the discussions were video-recorded and transcribed.

Table 2: Definition of codes for participants' comments on the recorded role-play (Rosaen et al. (2008))

Comments	Definition
Focus on Teacher-Management	Managing students' behavior, role in organization for a smooth lesson flow
Focus on Teacher-Instruction	Instructional strategy that facilitates the cognitive and social interaction around the goals of the lesson; focuses on the teacher's role
Focus on Student-Management	Managing students' behavior, organization for a smooth lesson flow; focuses on the children's behavior or attitudes
Focus on Student-Instruction	Instructional strategy that facilitates the cognitive and social interaction around the goals of the lesson; focuses on how the students responded to the instruction
Student Achievement	Preservice teacher indicates attention to student learning and achievement or assesses student learning
Other	Other comments or utterances to maintain the conversation

Adapting Fujie (2000)'s coding scheme for teacher-student discourse (Table 1), we coded all of the utterances in the puppetry and self-performed role-plays to examine how the students performed. This scheme was designed to study how classroom discourse is organized, especially focusing on formal academic utterances versus informal or everyday utterances. We wished to identify any differences in role-play discourse that were due to puppet use. Two of the authors carried out independent ratings ($\kappa = .791$). In addition, we analyzed the paper and online feedback, adapting Rosaen et al. (2008)'s coding scheme (Table 2) in order to examine how the students reflected on their role-playing in both conditions ($\kappa = .869$). The student discussions after giving mutual feedback were coded with the same scheme. Coding discrepancies were reconciled by mutual agreement.

Findings

The discourse analysis shows that the coding categories "Teacher-Formal," "Teacher-Informal," "Student-Formal," and "Student-Informal" are found to have significant differences (Table 3). This explains that the participants tended to use informal discourse more in the puppetry than in the case of normal self-performed role-plays where they rarely used informal one. Consistent with our previous study (Wakimoto et al. 2013), this result indicates that puppetry can allow an improvisational role-play that elicits a variety of reactions from the actors.

Table 3: Total number of categorized utterances in the discourse in the role-play

Utterances	Puppetry	Normal	
Teacher-Formal	353(-)	309(+)	
Teacher-Informal	88(+)	9(-)	
Teacher-Double barreled	23	14	$\chi^2(2) = 50.956, p < .01$
Student-Formal	121(-)	88(+)	
Student-Informal	55(+)	8(-)	
Student-Double barreled	26	16	$\chi^2(2) = 17.780, p < .01$

Note: (+)(-) are the results based on the residual analysis.

The analysis of the mutual feedbacks and the student discussions finds that the participants tended to give more feedbacks focusing on "Student-Management" and less on "Teacher-Instruction" in the mutual feedbacks and the discussion (Table 4). The participants also talked in the discussion less focusing on teacher-management. These results indicate that the EduceBoard system has possibility to allow the participants to shift their points of view from teacher-centric to student-inclusive even during the reflection.

Also there is an interesting finding is that the participants tended not to play their roles with a variety of informal reactions as is expected in everyday conversations, even after the puppetry. This indicates that the characteristics of normal or self-performed role-play are robust and that there is need of some additional intervention in addition to the use of EduceBoard in order to conduct successful learning transfer.

Table 4: Total number of categorized ideas in comments and discussion

Comments	Comments		Discussion	
	EduceBoard	Normal (Paper)	EduceBoard	Normal
Focus on Teacher-Management	10	9	75(-)	91(+)
Focus on Teacher-Instruction	26(-)	56(+)	147(-)	161(+)
Focus on Student-Management	39(+)	0(-)	112(+)	28
Focus on Student-Instruction	8	10	29	32
Student Achievement	0	0	21	14
Other	0	0	81	107
Fisher's exact test, $p < .001$			$\chi^2(5) = 50.305, p < .01$	

Note: (+)(-) are the results based on the residual analysis.

Discussion

This study shows how the use of puppets as transitional objects that elicit a projection of self (puppeteer) to non-self (puppet) elicited a variety of informal discourse that is rarely used in self-performance but is useful for learning communication in role-play. The EduceBoard system, which records the puppetry role-play, also facilitates reflection from the viewpoints of each of the actors. However, there are some procedural issues remaining with this approach.

One important issue is transfer to the self-performed role-play or actual practice. On the basis of the self-performed role-plays we found that transfer was not effective even immediately after the puppetry role-play with EduceBoard. Hence, more intervention to broaden and deepen students' perspective-taking ability is needed, including development of new curriculum materials. One promising way to foster deep perspective-taking may be through the use of new media, for example virtual environments. Lindgren (2012) indicated that experiencing a first-person perspective on a virtual world can generate a person-centered learning stance and perspective-taking. We consider this to be a potentially effective way to elicit more discussion about not only the performance of a variety of characters in role-play but also the content of reflection and conversation on this performance from the viewpoints of diverse characters. The EduceBoard system can introduce such technologies in order to foster participants' reflection more effectively.

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Acknowledgments

This research was supported by JSPS KAKENHI Grants-in-Aid for Scientific Research (B) (Nos. 26282060, 26282045, and 24300286) from the Japan Society for the Promotion of Science.