UNCOVERING TEACHER'S VIEWS VIA IMAGINED ROLE-PLAYING

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Role-playing is considered a valuable pedagogical strategy in a variety of fields. However, the use of this strategy in teacher education is underdeveloped. In this study we employ script-writing for a play (which we consider imagined role-playing) as a variation on a role-playing method. We invited teachers participating in a Master of Education professional development program to write an imagined dialogue with a colleague, in which they advocate for their teaching methods. The scripts reveal participants' ideas about teaching as well as their perceptions of nature of criticism and opposition to their ideas. The benefits of the script-writing method are discussed.

ON ROLE PLAYING

Role-playing is an unscripted "dramatic technique that encourages participants to improvise behaviors that illustrate expected actions of persons involved in defined situations" (Lowenstein, 2007, p. 173). In other words, role-playing is "an 'as-if' experiment in which the subject is asked to behave as if he [or she] were a particular person in a particular situation" (Aronson & Carlsmith, 1968, p. 26).

Role-playing is used as an effective pedagogical strategy in a variety of fields, a few of which we mention here. Traditionally it is used in social studies classrooms in order to provide participants with more authentic experiences of historic events and people who experienced them (e.g., Cruz & Murthy, 2006). It is used to explore the complexities of social situations, such as prejudice, and ethical issues (e.g., Lawson, McDonough, & Bodle, 2010; Plous, 2000). Participants, after engaging in role-playing, reported being better prepared to deal constructively with everyday instances of prejudice (Plous, 2000) and generated more effective responses to prejudiced comments (Lawson, McDonough, & Bodle, 2010).

Role-playing is also used in the education of various groups of professionals in organizational research, where, for example, participants assume roles of interviewers of job applicants or performance evaluators (Greenberg & Eskew, 1993). It is also prevalent in the training of health professionals, where the participants play the roles of a care-giver and a patient, practicing their clinical, diagnostic and patient managements skills, and as such developing empathy and tolerance in a low-risk environment (e.g., Joyner & Young, 2006). However, among various uses in developing professionals, the use of role-playing in teacher education is rather rare.

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ON ROLE-PLAYING IN TEACHER EDUCATION

In considering role-play in teacher education, Van Ments (1983) described it as experiencing a problem under unfamiliar constraints, so that one's own ideas emerge and one's understanding increases. In this sense, role-playing can also be seen as role-training. It is aimed at increasing teachers' awareness of various aspects of their actual work. Despite the known advantages, role-playing in teacher education is underdeveloped. While some authors advocate for this method and report on its implementation, this is most often done in the form of self-reports and anecdotal evidence of participants' experiences. A few examples are below.

Kenworthy (1973) described a method in which one participant takes on a teacher-role while others take on the roles of various students (e.g., a slow student, a gifted student, a disturbing student). He considered this type of role-playing to be "one of the most profitable, provocative and productive methods in the education of social studies teachers" (p. 243). He claimed that engagement in role-playing activities helped participants anticipate difficulties they encounter in their classrooms and as such gain security in their successful experiences should they face similar situations on the job. In a similar fashion, with a particular focus on teaching mathematics, Lajoie and Maheux (2013) used role-playing in courses for prospective elementary school teachers, where participants improvise around mathematical tasks. They suggested that role-playing experience is instrumental in preparing teachers to deal with unpredictability of teaching situation.

ON SCRIPT WRITING

Despite the recognized advantages, time and participation logistics are a significant limitation of role-playing. If we intend to engage our students in role-playing during class time, only a few will be active players and the remainder will serve as an audience. To give all students the opportunity to participate in the role-playing scenario we turned to imagined role-playing, that is, writing a script for a dialogue between characters. We consider this to be imagined (rather than enacted) role-playing.

The use of script writing as an instructional tool has been implemented in prior mathematics education research. For example, Gholamazad (2007) developed the 'proof as dialogue' method. Prospective elementary school teachers participating in her study were asked to clarify statements of a given proof in elementary number theory by creating a dialogue, where one character had difficulty understanding the proof and another attempted to explain each claim. This method was amended and extended by Koichu and Zazkis (2013) and Zazkis (2013) in their work with prospective secondary school teachers. In both studies the participants had to identify problematic issues in the presented proofs and clarify those in a form of a dialogue, referred to as a proof-script. These scripts revealed participants' personal understandings of the mathematical concepts involved in the proofs as well as what they perceived as potential difficulties for their imagined students.

Additionally, the 'lesson play' method was developed and used in teacher education in which participants were asked to write a script for an imaginary interaction between a teacher-character and student-character(s) (Zazkis, Sinclair, & Liljedahl, 2013). 'Lesson play' was juxtaposed with the traditional 'lesson plan' and how the former may account for the deficiencies of the latter was outlined. The method was advocated as an effective tool in preparing for instruction, as a diagnostic tool for teacher educators, and as a window for researchers to studying a variety of issues in didactics and pedagogy. In this study we extend the script-writing method by using it to investigate experienced teachers perceptions of teaching.

THE STUDY

Participants in this study were practicing teachers in Master's of Education professional development program. Towards the end of the program they were asked to write scripts for an imagined conversation in which they explain and argue for their approach to teaching. The interlocutor in this conversation had to be either a colleague, a school principal or a concerned parent. In this paper we analyse the 14 scripts that were dialogues with a colleague.

The participants were provided with the particular setting for such a conversation and a starting prompt:

> It is 8:15 in the morning and you are busy preparing for your classes. A colleague comes to you room and says something like that: "Listen, I know you are doing your Master's and all. But have you thought about what this is doing for the kids?"

The task was to continue this conversation. The morning hour was chosen to keep the conversation rather focused, as 8:30 is the usual time when classes start. It also provided an opportunity to interrupt the conversation 'by the bell' without reaching a conclusion or an agreement, though only a few opted for this choice. The mention of 'kids' was also intentional in order to guide the conversation towards students' activity rather than general teaching strategies. Our analysis focuses on the needs of students that are attended to in the imagined dialogues.

THEORETICAL CONSIDERATIONS: STUDENTS' NEEDS

Sfard (2003) surveyed a variety of theoretical frameworks and identified ten needs of learners, according to these theories, that are "the driving force behind human learning and must be fulfilled if this learning is to be successful" (p. 357). These are: the need for meaning, the need for structure, the need for repetitive action, the need for difficulty, the need for significance and relevance, the need for social interaction, the need for verbal symbolic interaction, the need for a well-defined discourse, the need for belonging, and the need for balance. While the theories that Sfard considered were not specific to learning mathematics, she described how these various needs were featured in the NCTM standards. As such, we use categories identified by Sfard as a theoretical lens for our analysis.

In our analysis we identified the main themes that emerged in teachers' arguments as well as in the arguments of their imaginary interlocutor. We focused on how different intellectual needs of learners were featured in the scripts.

RESULTS AND ANALYSIS

Table 1 indicates what needs of students appeared in the scripts. We note significant overlap among various needs of students and acknowledge the difficulty in discussing them separately. Despite this, we identified the needs that are most evident in the teachers' descriptions of what they do or intend to achieve in their teaching (¶). We analysed each script individually and then compared the analyses and reconciled minor differences. Further, in each script we noted what appeared to be the most prevalent need of students to which the participants attended (¶¶).

Needs/ /Parti-cipant#	meaning	structure	repetitive action	difficulty	significance and relevance	social interaction	verbal symbolic interaction	well-defined discourse	belonging	balance
P#1	¶	¶		¶		¶¶	¶	¶		¶
P#2	¶¶	¶		¶				¶		
P#3	¶¶	¶			¶					¶
P#4	¶	¶		¶	¶	¶¶	¶			¶
P#5	¶¶	¶				¶	¶			¶
P#6	¶					¶¶	¶		¶	¶
P#7	¶	¶					¶			
P#8	¶			¶	¶¶	¶			¶	
P#9	¶	¶¶	¶	¶	¶	¶¶				
P#10	¶					¶				¶
P#11	¶¶			¶		¶				¶
P#12	¶	¶¶	¶			¶				¶
P#13			¶	¶	¶				¶	
P#14	¶		¶	¶		¶				¶

Table 1: Students' needs according to Sfard (2003) identified in the scripts

As is evident in Table 1, the need for meaning/causality and the need for communication or social interaction were featured in almost all the scripts and were of central importance to most script-writers. We exemplify below how these needs were described in the imaginary dialogues. While the participants often used their personal names in the dialogues, we refer to interlocutors anonymously as 'participant' and 'colleague'. While in some scripts one particular need was emphasized, we chose to present the next script because it attended to a variety of students' needs. It was written by a Grade 2 teacher (P4).

1 Colleague: I know you have been busy with your masters, and are very passionate about what you have been doing but have you thought about how confusing this new type of math might be to them, not to mention the fact that when they come to me next year the math will be totally different?

2 Participant: Well Tom I am sure it will be different […]. But I do question why you

would think it would be confusing for the kids?

3 Colleague: I know that the kids in your class do some math but in all honesty it isn't really the math that the rest of the staff is teaching. I don't actually see a lot of them sitting down and doing math like the way they would be doing it in my class and I'm quite concerned that you have not provided them with a strong foundation. […]

4 Participant: Well I do think learning math facts has its place, however we usually do this through math games or some kind of partner activity. Computation is just one part of the math in my classroom. It's important to try and integrate a variety of tasks that challenge students in the area of problem solving and being able to communicate their understanding in mathematics. I know it looks a bit chaotic and its noisy, but I do believe the students are building strong understanding in their mathematics.

5 Colleague: Math should be a quiet time. It should be a time for students to focus on solving problems without all this noise.

6 Participant: Quiet is not always good. It could mean that students are stuck and don't know what to do? I look at talking time in math as a time to share different ways to arrive at an answer. It's a chance for students to learn from each other. […] I try to differentiate instruction through open ended learning tasks. […] Not only are the problems designed for kids with different learning capabilities, but all the kids are helping each other. Sometimes it's not the final answer that's important, but rather the path they took to solve the problem.

7 Colleague: Well sometimes the beauty of math is they either have the right answer or they don't. Math needs to be quiet and kids need to be able to perform the operation correctly so they can solve the problem. Too much talking is a distraction.

8 Participant: It is true my kids are talkative during math, and yes we spend a lot of time on the floor, but that doesn't mean they are distracting others. By having them work on the floor with a friend kids can make connections and communicate with each other -it's a way of getting them to dig deeper into the math. […] They are trying to construct their knowledge so eventually they can move from the concrete to the symbolic. You might see that as play in grade one but it is important that students are able to show their understanding through those concrete materials. So what do you think my kids are doing on the floor, just out of curiosity? [...]

9 Colleague: Well like I said – it really doesn't look like math to me. It looks like they're having a good time, lots of talking.

10 Participant: (chuckle) Yes, you're right they are having fun.

11 Colleague: Well Math needs to be about learning Marie. We've got so much to cover. How can you spend so much time on group work?

12 Participant: […] Students are given a question but looking for different strategies to

solve it. In their groups, they discuss the different strategies so they know there is more than one way to arrive at an answer. Then together in a gallery walk, the kids get to explain their thinking in numbers, pictures and words as to how they solved that problem. Not only have they shown it, they now have to explain it and its really incredible how some of them arrive at an answer. It is a great opportunity for me to see who really understands the task.

13 Colleague: How am I supposed to keep track of what they actually learn or what they can do in my class at the end of the day? In my class, I have that workbook that I can look at. I choose a series of questions from the textbook so I can see all the questions and things they have solved. At the end of the day, what do you have to show as evidence as to what they have learned? You've had lots of great discussions again just going by what I see you've got these kids rolling on the carpet with their toys but they are not learning the importance of paying attention during a math lesson and they are not getting used to sitting in their desks quietly! They have all had a lot fun but have they really learned the math?

14 Participant Well I have their completed work, I have their verbal explanation, I've got their group work mark… […] I'm not sure that the depth of their explanations would be as great if they simply do just worksheets. […] Will they just have to calculate as opposed to showing you? We have really worked hard as a staff at encouraging the use of concrete materials into math. Our math room has all these wonderful manipulatives. […]

We note here a strong connection between students' need for social interaction and the need for meaning making in mathematics ([4], [8], [14]). The script-writer emphasizes the connection between students' understanding and their ability to explain. Furthermore, this excerpt demonstrates attention to other needs of learners. The mention of differentiated instruction and the design of tasks to accommodate learners of different capabilities [6] is consistent with the need for balance. In addition, the need for balance is acknowledged, implicitly, in mentioning a variety of tasks [4] and a variety of solution strategies [6], [12]. The need for difficulty is seen in the reference to tasks that challenge students [4]. The need for structure appears in mentioning connections and in the move from concrete t symbolic [8]. Further, in the repeated mention of concrete materials [8], manipulatives [14], or pictures [12] we recognize this script-writer's attention to students' need for significance and relevance as well as for symbolic interaction.

We acknowledge that while the participant-characters featured in the scripts refer mostly to students' intellectual needs, their colleague-characters refer to the needs dictated by the system, that is, by their understanding of their job description. This includes, for example, classroom management [3], covering the curriculum [11], following the textbook and providing assessment [13]. We also note a significant disagreement between the characters with respect to their views of mathematics. These issues are explored in our subsequent analyses.

IMAGINED ROLE-PLAY: WHAT IS LOST, WHAT IS GAINED

Enhanced interaction among group members, enhanced skills in collaboration and communication, are often considered among the outcomes and benefits of role-playing (e.g., Jackson and Walters, 2000; Mogra, 2012). These outcomes are unlikely to result from writing an imagined dialogue, unless participants collaborate on creating a script. But with this loss there are overwhelming gains, as we discuss below. Role-playing, as an improvisational procedure, requires that the players have a feeling of relative safety. Many unpleasant experiences of participants in role-playing have been attributed to a teacher's failure to "warm up" the group where members learn to know and trust each other. In script-writing the safety concern is marginal as the play is confined to personal imagination.

An important goal that is attributed to role-playing is training professionals to "think on their feet" (Alkin & Christie, 2002). However, one does not necessarily have to think on his/her feet in order to be prepared for it. To the contrary, the script-writing avoids the necessity of an immediate response and as such provides an opportunity for a more-thoughtful and a more-balanced response, that can be redrafted and reconsidered, and – eventually – be relied upon when the opportunity to think on one's feed presents itself.

Many authors agree that simulations and imagined situations can induce learning. In particular, Blatner (2009) described role-playing as "a technology for intensifying and accelerating learning". We add to this that script writing invites a thoughtful and balanced response to an imagined situation and in such can induce learning even further. In addition, it provides researchers with a recorded account of one's imagined scenario from a perspective of both (or several) interlocutors.

In this study the scripts produced by participants demonstrated their views of teaching, in which their emphasis on students' intellectual needs as learners becomes apparent. They also demonstrated participants' perceptions of which traditional views they may be facing in their practice. Script writing appeared a useful way to exemplify and elaborate upon a potential struggle teachers who strive to improve their practice encounter.

References

Alkin, M. C., & Christie, C. A. (2002). The use of role-play in teaching evaluation. *American Journal of Evaluation*, *23*, 209-218.

Aronson, E., & Carlsmith, J. M. (1968). Experimentation in social psychology. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (Vol. 2, pp. 1-79). Reading, MA: Addison-Wesley.

Blatner, A. (2009). *Role playing in Education*. Retrieved from http://www.blatner.com/adam/pdntbk/rlplayedu.htm

Cruz, B., & Murthy, S. (2006). Breathing life into history: Using roleplaying to engage students. *Social Studies and the Young Learner*, *18*(3), 4-8.

Greenberg, J., & Eskew, D.E. (1993). The role of role-playing in organizational research. *Journal of Management*, *19*(2), 221-241.

Jackson, P. T., & Walters, J. P. (2000). Role-playing in analytical chemistry: The alumni speak. *Journal of Chemical Education*, *77*(8), 1019-1026.

Joyner, B., & Young, L. (2006) Teaching medical students using role play: Twelve tips for successful role plays. *Medical Teacher*, *28*(3), 225-229.

Kenworthy, L. S. (1973). Role-Playing in teacher education. *Social Studies*, *64*(6), 243-247.

Koichu, B., & Zazkis, R. (2013). Decoding a proof of Fermat's Little Theorem via script writing. *Journal of Mathematical Behavior*, *32*, 364-376.

Lajoie, C., & Maheux, J.-F. (2013). Richness and complexity of teaching division: prospective elementary teachers' roleplaying on a division with remainder. In *Proceedings of the Eighth Congress of European Research in Mathematics Education (CERME 8),* Manavgat-Side, Antalya. Retrieved from http://cerme8.metu.edu.tr/wgpapers/WG17/WG17_Lajoie.pdf

Mogra, I. (2012). Role play in teacher education: Is there still a place for it? *TEAN Journal*, *4*(3). Retrieved from http://bit.ly/AtMwtr

Lawson, T. J, McDonough, T. A., & Bodle, J. H. (2010). Confronting prejudiced comments: Effectiveness of a role-playing exercise. *Teaching of Psychology*, *37*, 256-261.

Lowenstein, A. J. (2007). Role play. In M. J. Bradshaw & A. J. Lowenstein (Eds.), *Innovative teaching strategies in nursing* (4th ed., pp. 173-182). Boston, MA: Jones and Bartlett.

Plous, S. (2000). Responding to overt displays of prejudice: A role playing exercise. *Teaching of Psychology, 27*(3), 198-201.

Sfard, A. (2003). Balancing the unbalanceable: The NCTM Standards in the light of theories of learning mathematics. In J. Kilpatrick, Martin, G., & Schifter, D. (Eds.), *A research companion for NCTM Standards* (pp. 353-392). Reston, VA: National Council for Teachers of Mathematics.

Van Ments, M. (1983). *The effective uses of role-play: A handbook for teachers and trainers*. London: Kogan Page.

Zazkis, D. (2013). *Odd dialogues on odd and even functions*. Paper presented at the Conference for Research in Undergraduate Mathematics Education, Denver, CO. Retrieved from http://sigmaa.maa.org/rume/crume2013/Abstracts_Files/rume16_submission_21.pdf

Zazkis, R., Sinclair, N., & Liljedahl, P. (2013). *Lesson play in mathematics education: A tool for research and professional development*. Dordrecht, Netherlands: Springer.