Exploring the Interactive Use of Video Cases in Scaffolding Prospective Teachers in Learning Clinical Interview Method

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Abstract: Numerous studies have shown that the clinical interview method has played an important role in helping educators and researchers to gain deep insight into children's mathematical thinking, and thereby improve their classroom teaching. However, very little research has been done on the development and design of such training. Therefore, the purpose of this study was 1) to explore the possible benefits of using a new approach to teach clinical interviewing skills, and 2) to investigate how an expert commentary feature can help prospective teachers to learn clinical interview methods. Forty prospective teachers participated in this study and completed a series of carefully designed lessons involving video case analysis with expert commentary. A mixed of qualitative and quantitative method was used to analyzed all the data. The results showed that the prospective teachers found this new approach helpful in learning to conduct clinical interviews.

Keywords: clinical interview, video analysis, case-based learning, early childhood education, mathematics education, teacher education, instructional technology

1. Introduction

Clinical interview has played an important and powerful role in helping pre-service and in-service teachers to gain deep insight into their students' mathematical thinking, and has thereby enabled teachers to assist their students in constructing meaningful mathematical knowledge and enhancing their mathematical learning potential (Baroody & Ginsburg, 1990; Buschman, 2001; Confrey, 1980; Doig & Hunting, 1995; Ginsburg 1981; Ginsburg, 1997; Ginsburg, Jacobs & Lopez, 1998; Ginsburg, Kaplan, & Baroody, 1992; Ginsburg, Kossan, Schwartz & Swanson, 1983; Hunting, 1997; Kaplan, King, Dickens, & Stanley, 2000; McDonough, Clarke & Clarke, 2002; Peck, Jencks, & Connell,1989; Rowland, 1999; Schorr & Ginsburg, 2000; Schorr & Lesh, 1998; Wright & Ellemor-Collins, 2008; Zazkis & Hazzan, 1999.)

Although there is growing evidence of the need to teach clinical interviewing techniques to both pre-service and in-service teachers, very little research has been done on the development and design of such training. With the use of videos, case-based discussion has been found to be a useful tool for both engaging pre-service teachers in observing, noticing, interpreting, discussing, reflecting, and transforming ideas about a complex or ill-structured teaching situation and capturing such change (Hatch & Grossman, 2009; Kinzer & Risko, 1998; Sherin & Han, 2004; Sherin & Van Es, 2005; Van Es & Sherin, 2002). Yet studies documenting the ways and means of teaching and training clinical interview methods are still very limited, and there is no literature on how the instructional design of a video case-based learning environment could help pre-service or in-service teachers to develop clinical competency of this type.

2. Methods

2.1 Participants

Participants in this study were 40 graduate students from Teachers College, Columbia University enrolled in "Development of Mathematical Thinking" course. The students in this course were pre-service teachers pursuing Master degrees in early childhood or mathematics education.

2.2 Measures

The task (which is also referred as clinical interview expert commentary video lesson) used in this study was embedded in a Web-based application called VITAL (Video Interactions for Teaching and Learning), which was designed to support prospective teachers in studying early childhood mathematical education. Therefore, this study used 3 different kinds of data: (a) students' analyses of videos and comments on the lesson (which will refer to pre and post-commentary answers later on); (b) students' answers to the survey questions; and (c) students' clinical interview final project scores from the class.

2.3 Analysis Procedure

A mix of qualitative and quantitative data analyses were used in this study. The development of the coding schemes began with an extensive content analysis of the pre and post commentary answers as well as the open-ended answers in the end-of lesson survey, for a total of 400 video analysis answers. Eight sets of coding schemes were developed to analyze the participants' responses. There are three major categories: a) coding schemes for all pre-commentary responses, b) coding schemes for all post-commentary responses, and c) coding schemes. All the responses were coded by the author and another independent researcher. The kappa value for the inter-rater reliability of all the pre-commentary questions is k=0.80 and of all the post-commentary questions is k=0.81.

3. Results

3.1 Helpfulness of the Expert Commentary Video

Table 1. Helpfulness of the Expert Commentary Video

Rating scale	Frequency (counts)	Percentage
Very Helpful	20	50%
Helpful	16	40%
Somewhat Helpful	4	10%
Total	40	100%

The data was obtained at the end of the video lesson, when the participants were asked to give a four level rating (very helpful, helpful, somewhat helpful, and not helpful). Overall, all the participants (N=40) in this study reported that this video case analysis lesson with expert commentary, was helpful in varying degrees in learning clinical interview. Specifically, 50% of them rated it as "very helpful", 40% said it was "helpful" and only 10% reported it "somewhat helpful". "Not helpful" was not found (see Table 1).

3.2 Video Case Analysis Comparison Within Pre-Commentary Questions

Table 2. Paired T-Test Results For the Two Pre-Post Question Sets Within the Pre Commentary Questions

Question set	Mean	SD	df	T
Q1 vs. Q3	-3.00	.853	39	-2.223**
Q7 vs. Q9	-3.50	1.027	39	-2.156**

** p<.02 (1-tailed)

Since Q1 and Q3 need participants to apply similar concepts to evaluating clinical interviewing techniques, and Q7 and Q9 require similar clinical reasoning methods for the case, we were able to use Q1 and Q3 as a pre-post comparison set, and Q7 & Q9 as another set. As shown in Table 2, the results suggest that there was a significant difference in these prospective teachers' pre and post video analysis levels for both question sets (Q1& Q3, t=-2.223, p<.02 and Q7 & Q9, t=-2.156, p<.02). Therefore, the prospective teachers did show significant differences in their video case analysis in these two pre-post question sets within the pre-commentary questions (Q1 vs. Q3 & Q7 vs. Q9). More details about what factors could contribute to this difference will be discussed later on.

3.3 Video Case Analysis Level on All Pre-Commentary Questions

Table 3. Frequency and Percentage of Video Analysis Level on All Pre-Commentary Questions (N=40)

	Q1	Q3	Q5	Q7	Q9
Level 1	6 (15%)	2 (5%)	6 (15%)	11 (27%)	3 (7%)
Level 2	16 (40%)	12 (30%)	33 (83%)	14 (35%)	16 (40%)
Level 3	18 (45%)	26 (65%)	1 (2%)	15 (38%)	21 (53%)
Total	40 (100%)	40(100%)	40(100%)	40(100%)	40(100%)

The frequencies and the percentages of each video analysis level for individual questions are shown in Table 3. As we can see, Q3 has the highest frequencies (and percentages) in Level 3 among all the pre-commentary questions; followed by Q9. Most of the prospective teachers did not do so well in Q5, but did better in Q3 and Q9. The frequencies (and percentages) in Q1 and Q7 are spread out among all three levels, though the Level 2 and Level 3 have a slightly higher percentage in Q1 than in Q7.

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