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Integrating video evidence in mixed methods research: Innovations, benefits, and challenges for research exploring how beliefs shape actions

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ABSTRACT

The purpose of this article is to demonstrate the benefits of using video evidence as a catalyst for innovative integration in mixed methods research. We illustrate how video data were used in the elicitation interviews of three teachers to understand their interpretations of how their beliefs align with their observed practices and how they attempted to reduce cognitive dissonance that became apparent during the video elicitation interviews. This article draws from the mixed methods case study phase of a larger explanatory sequential mixed methods study conducted in Jamaica with 248 secondary school teachers. A subsample of eight teachers participated in follow-up mixed methods case studies. Case study data were collected in the form of qualitative and quantitative observation data, video recordings, semi-structured interviews, and video elicitation interviews. The video elicitation interview increased credibility in the inferences drawn about how beliefs shaped actions by allowing the teachers to answer in a more conscious, reflective manner as they selected segments of the videos that they felt reflected their beliefs about teaching in terms of learner-centeredness and teacher-centeredness. All data for each case were integrated using joint display analysis. The findings revealed that teachers' stated beliefs that their teaching practices were more student centered were not evident in the video data collected which resulted in cognitive dissonance for some teachers. The videos provided an opportunity for the researcher to understand the inconsistencies in the data and how the teachers dealt with dissonance between their beliefs and actions that would not have been afforded without the use of videos during the elicitation interview. Integrating video data in research into psychological constructs has implications for educational psychologists as well as mixed methods researchers. Future research on the use of video elicitation in research about beliefs versus actions can consider using this visual method over a longitudinal timeframe to see if the use of video elicitations prompts change in beliefs and/or actions.

1. Introduction

Researchers are generally challenged in measuring certain psychological constructs that are considered unconscious drivers of behaviors, such as beliefs (Pajares, 1992). Beliefs are often implicit and ingrained so deeply that individuals are not aware of them (Argyris and Schön, 1974; Osterman and Kottkamp, 1993). To measure constructs such as beliefs, researchers often use data collection instruments involving implicit methods that require participants to respond to spontaneous, automatic, or unconscious prompts (Di Martino and Sabena, 2010; Harms and Luthans, 2012). Unconscious prompts typically involve subliminal priming which occurs when an individual is exposed to stimuli below the threshold of consciousness (Elgendi et al., 2018). The challenge often lies in the fact that participants are generally unaware of what construct is being measured (Harms and Luthans, 2012) and of any possible inconsistencies between their stated beliefs and actions (Osterman and Kottkamp, 1993).

Argyris and Schön (1974) suggest that because the beliefs that underpin actions are often not explicit, to identify them, actual behavior must be observed. However, researchers are also challenged when inferring beliefs from observations because the contexts for an event as well as the meanings people ascribe to the event are personal and specific (Di Martino and Sabena, 2010). To infer a person's beliefs with any degree of credibility, one needs numerous and varied data sources from which to draw those inferences (Cross Francis, 2014). Researchers need methods to create opportunities to examine these inconsistencies (Di

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Martino and Sabena, 2010).

Visual methods offer a powerful tool for examining these inconsistencies (Andrews and Leonard, 2018; Bailey and McAtee, 2003; Di Martino and Sabena, 2010). Visual methods are increasingly being used in social science, possibly due to "the importance of the visual in contemporary culture" (Rose, 2014, p. 26). A visual "is never a 'mere' reflection of reality, but […] can be used in tandem with other sources of data to obtain a more complex view of the subject of the research" (Bailey and McAtee, 2003, p. 45). Visuals can be combined with other forms of data and/or data analysis procedures in mixed methods research. For the purposes of this article, we define mixed methods research as the deliberate combination or merging of two or more research methodologies in a single study (Shannon-Baker and Edwards, 2018). In mixed methods research, visual methods have been integrated with other forms of data (e.g., Haynes-Brown and Fetters, 2021; Peroff et al., 2020) to expand and complicate quantitative and qualitative data (e.g., Edwards and Creamer, 2018; Ridgway et al., 2018; Shannon-Baker, 2015), support theory generation (e.g., Peroff et al., 2020), and strengthen the validity of findings (Liebenberg, 2009; Peroff et al., 2020; Shannon-Baker, 2015).

Although visual methods are philosophically aligned with mixed methods research (cf. Shannon-Baker and Edwards, 2018), the use of video elicitation in mixed methods research is less widely discussed. Video elicitation is described as a visual method that uses video during interviews to encourage more in-depth and detailed discussions (Henry and Fetters, 2012; Shannon-Baker and Edwards, 2018). Video elicitation therefore provides researchers with an integrated method of examining implicit drivers of behaviors and allow respondents to answer in a more conscious, reflective manner. In so doing, video elicitation allows researchers to identify inconsistencies, raise participants' awareness of implicit beliefs that underpin actions, and examine how participants explain inconsistencies between their beliefs and actions. The purpose of this article is to demonstrate the benefits of integrating videos as a tool for innovative integration in mixed methods research through the use videos as a form of data collection and elicitation in mixed methods research. We also offer recommendations for researchers in using this method.

1.2. Literature review

1.2.1. Use of and benefits of visual methods

Social science researchers incorporate visual methods in their studies for various reasons. Visual methods can generate "evidence that other methods […] cannot," reveal ordinary nuances to life, encourage researcher reflection on the data, and encourage collaboration between the creator of the visual and those depicted in the visual (Rose, 2014, p. 28). In psychology, researchers have used visual methods to reveal cognitive processes (Marshall, 2007), evaluate children's understanding of basic emotions (Brechet et al., 2009), and expand understandings of the experiences of women migrants and asylum seekers (Haaken & O'Neill, 2014). Visual methods can also help build rapport with participants across linguistic and cultural barriers (Edwards and Creamer, 2018; Peroff et al., 2020; Shannon-Baker and Martinez, in press; Ubha and Cahill, 2014), increase "contextual accuracy" of the study (Liebenberg, 2009, p. 441), encourage participants' processing of difficult or negative experiences (e.g., Rule and Harrell, 2006; Shannon-Baker, 2015), and reveal how participants construct their own identities in relation to others (e.g., Bagnoli, 2004, 2009; Shannon-Baker, 2015).

1.2.2. Use of and benefits of visual elicitation methods

Elicitation methods refer to the use of techniques to further and deepen another data set such as qualitative data collected through interviews (Barton, 2015). Many visual methods have been used for elicitation purposes in interviews, such as participant-generated drawings, life grids, new and old photographs, and videos (e.g., Crilly et al., 2006; Galman, 2009; Latham, 2004; Nico, 2016; O'Connell, 2013; Shannon-Baker, 2015). In these cases, the visual created can themselves be a form of data in the larger study (e.g., Nico, 2016; Shannon-Baker, 2015) or used primarily to supplement an existing data set such as interviews (e.g., Bagnoli, 2009).

There are many reasons researchers use various visual elicitation methods. Elicitation methods can help participants further explore their own experiences beyond what might otherwise surface during traditional interviewing techniques (Bagnoli, 2004, 2009; Barton, 2015; Nico, 2016; van Braak et al., 2018). Visual elicitation methods can help participants communicate experiences, beliefs, and emotions that are difficult to put into words (Bagnoli, 2004, 2009, 2009; Peroff et al., 2020; Shannon-Baker and Edwards, 2018; Weber, 2008). In community spaces, visual elicitation can help "reveal community values, attitudes and beliefs, as well as the meaning that participants attribute to aspects of the local setting" (Barton, 2015, p. 197). Visuals, especially participant-generated, can expose ideas, meanings, and nuances that might otherwise be overlooked by an outsider (Barton, 2015). Video elicitation can encourage reflection on professional practices, making the research process a learning opportunity for professional growth (van Braak et al., 2018). Rather than a static photograph of a single moment in time, a video shows the sequence of events, actions, and reactions providing deeper context for discussion.

1.2.3. Challenges in using visual and visual elicitation methods

One challenge faced in the use of visual methods is identifying who and how to interpret the visuals which can represent many layers of meanings (cf. Grady, 2008; Shannon-Baker and Edwards, 2018). Whereas individual participants may interpret a visual in one way, others including the researcher may have other interpretations. To address this challenge, embedding visual methods as form of elicitation encourages participants to identify their own or intended meaning in the visual (e.g., Galman, 2009; Liebenberg, 2009; Nico, 2016); such meaning may be as relevant to researchers as what is documented in the visual (Alerby, 2000). Some visuals used, such as photographs or existing art, may not directly relate to a specific event or practice (van Braak et al., 2018). While researchers can select and use participant generated visuals, researcher-selected or generated visuals for elicitation "limits participants' ability to represent their experiences" (Barton, 2015, p. 198; Nico, 2016; van Braak et al., 2018).

Additionally, there has been a "suspicion of visual methods" historically considering how visuals have been used to subjugate, colonize, and enslave people as well as political and governmental propaganda (Mees and Murray, 2019, p. 2). The skepticism of the value of visual methods is also connected to the assumption and use of visuals as supplementary to qualitative and quantitative forms of data. This skepticism has critiqued whether visuals themselves (e.g, videos, photographs, drawings) are themselves a source of credible and trustworthy data (Mees and Murray, 2019). As a result, researchers who use visual methods often provide rationalizations or devote their argument in publications to substantiating the use of visual methods (cf. Shannon-Baker and Edwards, 2018; Shannon-Baker and Martinez, in press).

In using video elicitation, participants may feel they are being judged by the researcher (van Braak et al., 2018). This can result in apprehension in participating in the research or limited responses during the video elicitation. This feeling can be mitigated by establishing stronger relationships with the participants, having them interviewed by a peer, and emphasizing the goal of the study is not to evaluate the participant (van Braak et al., 2018). Additionally, participants can be encouraged to select their own portions of a video to discuss further, which may promote more feelings of agency and freedom of expression (van Braak et al., 2018). Video-elicitation is an apt tool for exploring participants' interpretations of how implicit drivers of actions such as their beliefs shape their actions.

1.3. Background to the study

To showcase the use of video elicitation in mixed methods research, we draw from a mixed methods study conducted by Haynes-Brown that provided insights into how teachers interpreted their beliefs as a driver of their actions and how they addressed inconsistencies between their beliefs and their use of technology revealed through video evidence. These inconsistencies created a state of cognitive dissonance.

1.3.1. Psychological construct: cognitive dissonance

Cognitive dissonance is described as a psychological state of discomfort that is aroused by the realization that one's actions are in contrast to one's beliefs (Festinger, 1957). Covey (2009) explains that when an individual is confronted with the reality that their behavior is not consistent with their beliefs, it is more likely that the individual will attempt to change the cognition about the belief since it is more fluid than dealing with the inconsistency. Individuals deal with the inconsistency between their beliefs and actions in different ways (Festinger, 1957). Becoming aware of the inconsistencies between beliefs and actions can result in varied reactions: i) changing one or several involved elements in the dissonance relationship (e.g., changing an opinion to fit a behavior), ii) adding new elements to reduce the inconsistency (e.g., adopting opinions that fit a behavior), iii) reducing the importance of the involved elements, and iv) using avoidance strategies to reduce dissonance (Cohen and Sherman, 2014). There are times when these attempts to reduce the dissonance fail and the tension remains. This underlying tension then motivates an individual to change the behavior to produce consistency between beliefs and behaviors (Covey, 2009).

For teachers, beliefs are considered important in justifying and unifying their decisions and actions in the classroom (Bruner, 1996; Posner and Vivian, 2010; Richardson, 1996). However, teachers' beliefs are often inconsistent with their classroom practices (Di Martino and Sabena, 2010; Osterman and Kottkamp, 1993; Cross Francis, 2014). For example, teachers may espouse beliefs that are more in keeping with widely accepted and promoted constructivist learner-centered philosophy, rather than one reflecting a more teacher centered philosophy. Learner-centered pedagogy is undergirded by a constructivist perspective that considers students' prior knowledge, interests, and attitudes as important starting points for learning; students can create new meanings from interaction with the content and importantly, students play an active role in their own learning (Bredo, 2000). Alternatively, teacher-centered pedagogy is characterized by a focus on discrete skills and factual knowledge, these classrooms generally involve passive learning where students are recipients of teachers' knowledge and wisdom (Ravitz et al., 2000). Learner-centered pedagogy is said to undergird a more effective approach to teaching (UNESCO, 2015); however, most teachers are eclectic, utilizing a mix of teacher-centered and learner-centered practices as the situation warrants. Habitual patterns of behaviors evident in classroom practices reveal the dominance of a distinct philosophy of good teaching that is either more teacher centered, or learner centered (Fives and Buehl, 2012; Grasha, 1996; Ravitz et al., 2000).

1.3.2. The Jamaican educational context

Historically, education in Jamaica was characterized by teachers who understood their role as being to possess the wealth of knowledge, and students were the receptacles (Mayne and Dixon, 2020). The power relationship between the teacher and student was predominantly undergirded by teacher-centered pedagogy. Jamaican policy makers and teacher educators alike have recognized the need for a paradigm shift in the education system from being one that is heavily reliant on teacher-centered pedagogy to one that is more learner centered (Mayne and Dixon, 2020). A central part of this shift has involved the integration of technology which is considered an important tool for pedagogic transformation (Haynes-Brown, 2014). "The shift, however, presents an epistemological dilemma, as teachers and students work in unfamiliar pedagogical territory to justify what it means to know" (Mayne and Dixon, 2020, p. 29). Thus, the interpretation of the findings from this study emerged from a context where teachers were figuring out how to infuse more learner centered pedagogy into existing and deeply ingrained teacher centered pedagogical practices.

1.4. Summary of the methods

The sample study used a multiphase mixed methods design. According to DeCuir-Gunby and Schutz (2017), this design combines several rounds of quantitative and qualitative data collection. The study was conducted with 248 teachers working in Jamaican secondary schools to understand how teachers' beliefs shape their use of technology (see Fig. 1). Haynes-Brown received approval from the university's ethical review board to conduct the study. She collected and analyzed the data used in this article.

1.4.1. Phase one: quantitative

In the first phase of the study, the relationship between teachers' beliefs and use of technology was tested using quantitative techniques. The data for this quantitative analysis were gathered using a self-report questionnaire measuring beliefs and use of technology. The data were analyzed using path analysis to examine the significance of teacher beliefs in accounting for variance in teachers' use of technology. Additionally, grouping syntax analysis was used to explore whether there was alignment in teacher centered or learner centered ways between the teachers' beliefs and use of technology.

1.4.2. Connecting the quantitative phase to the case study phase

The first point of integration in this study occurred at the sampling stage prior to data collection and analysis for the second phase. This form of integration can be described as connecting through the sampling frame (Creswell, 2014). Teachers for the case study phase were selected based on the data from the different alignment groupings generated from the quantitative phase. Three cases were selected for follow-up: i) teacher-centered alignment in beliefs and use of technology, ii) learner-centered alignment in beliefs and use of technology and iii) nonalignment–meaning highly learner centered beliefs and highly teacher centered use of technology. By selecting three cases displaying different philosophical alignments in the beliefs and use of technology, Haynes-Brown was able to present multiple perspectives of how beliefs that stem from different philosophical perspectives shape teachers' decisions and use of technology.

1.4.3. Phase two: mixed methods case study phase

To obtain a deeper understanding through these cases, multiple data sources were included: i) a semi-structured interview ii) video-recordings of teaching, iii) a quantitative observation checklist, iv) qualitative observation field notes, and v) video-elicitation interviews. Using multiple sources of data that involved both quantitative and qualitative data collection techniques allowed for integration in the analysis of the findings within the case study phase. A total of nine teachers comprised the three cases with three teachers per case, however one teacher withdrew during data collection reducing the total to eight teachers. Data collection for this case study phase was conducted over a period of nine months.

First, the semi-structured interviews were conducted to probe more deeply the teacher's beliefs. To gather this more explicit self-report data on beliefs about teaching, during this semi-structured interview the teachers were presented with a set of cards containing statements with contrasting philosophies of teaching. They were each asked to select the card with the statement that most closely aligned with their overarching belief about good teaching (cf Ravitz et al., 2000). If none seemed suitable, the teachers had the option of creating their own statement. This strategy was used as a springboard to further explore these beliefs. Following these semi-structured interviews, each teacher was observed

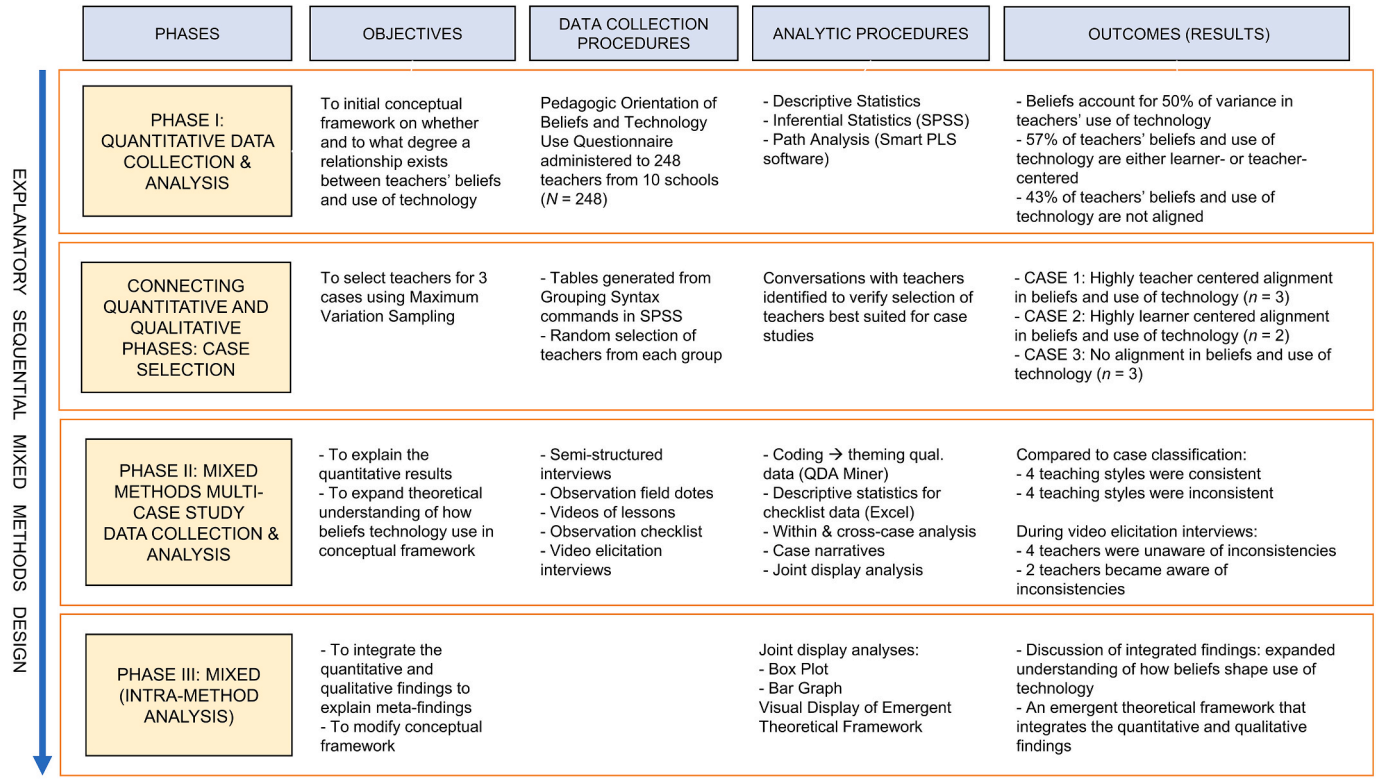

Fig. 1. Procedural Diagram: The Explanatory Sequential Mixed Methods Design. Adapted from Fetters (2020). Note: The diagram shows the objectives, data collection, analysis procedures, and outcomes for each phase horizontally.

teaching with technology at least three times. Each lesson observation was video recorded, and qualitative observation field notes were taken by Haynes-Brown during these lesson observations. The Focus on Integrated Technology: Classroom Observation Measurement (FIT:COM) quantitative observation checklist developed by Judson (2006) was then used to assess the videos to determine the extent that teachers' classroom practices in using technology reflected established guidelines for teacher-centered or learner-centered pedagogy. The higher the score awarded for each indicator on the instrument, the more learner-centered the pedagogy (Judson, 2006). Integrating quantitative and qualitative observation data collection techniques enhanced credibility of the observation findings by reducing weaknesses inherent in relying solely on one quantitative or qualitative data.

The video recordings were shared with the teachers at least one week prior to the video elicitation interviews. Each teacher was asked to watch the videos and make note of sections, times, and specific behaviors in the videos that they felt reflected their beliefs and effective use of ICT in preparation for the video elicitation interview (van Braak et al., 2018). The video elicitation interviews ranged from 60 to 105 min. The intent of the video elicitation interview was to obtain a deeper understanding of how teachers interpreted their use of technology as a reflection of their beliefs.

1.4.4. Integrating the data within the mixed methods case study phase and across phases

In analyzing the qualitative data collected in phase two, the QDA Miner software was used to manage the process of coding, categorizing and theming. The quantitative observation data were analyzed using descriptive statistics. Joint display analysis played an important role in the integration process. "Engaging in joint display analysis involves explicitly merging the results from the two data sets through a side-by-side comparison to assess for fit of the two types of data" (Haynes-Brown and Fetters, 2021, p. 2). The analysis of the integrated results for the case study phase involved developing joint display visuals that integrated the quantitative and qualitative observation data for the teachers within each case.

In the final integration of the overall study results across the two phases, joint display analysis was used to integrate the overarching results from the initial alignment groupings based on the quantitative phase and case study findings that showed the dominant teaching styles identified and the teachers' interpretation of their classroom practices from the qualitative interviews. Further details on the integration of the results from this study using joint display analysis are presented in another article by Haynes-Brown and Fetters (2021).

1.4.5. The role of the researcher

During the data collection in this case study phase, Haynes-Brown developed a cordial and supportive relationship with the teachers which introduced a possibility for subjective interpretations of the data and created a potential for bias (Locke et al., 2007). Furthermore, as the primary instrument in analyzing and interpreting the data in this case study phase, she was also aware that the researcher brings to the study certain presuppositions and values that could potentially introduce some bias. Consequently, verification procedures were used, including triangulation of data sources, member checking, thick and rich descriptions of the cases. Additionally, the videos were not only assessed by Haynes-Brown, the videos and the FIT:COM checklist were also given to an expert in the field of educational technology to independently rate the teachers' use of technology. These measures increased reliability in the findings from the study.

1.5. Exploring video elicitation: the case of Jamaican teachers' beliefs and use of information and communication technology

In this section of the paper, we focus on how the video data were used in the elicitation interview for three teachers: Roslyn from the teacher-centered case, Frederick from the learner-centered case, and Anna from the non-aligned case. Each teacher selected offers a unique

contribution to the discussion on how the video elicitation interviews provided a better understanding of the concept of cognitive dissonance.

1.5.1. Roslyn: a teacher-centered case

Roslyn was included in the teacher-centered case based on her responses in the quantitative phase. The analysis of her responses on the questionnaire revealed a predominantly teacher-centered orientation in her beliefs and use of technology. However, during this semi-structured interview Roslyn selected a card aligned with more learner-centered philosophy and explained further that she believed in allowing students to think for themselves because "you are not standing over them and just handing them the information; they are actually going out there and getting the information, analyzing it and interpreting it." This was somewhat surprising since she had previously indicated agreement with predominantly teacher-centered statements on the questionnaire. For example, on the questionnaire she had indicated strong agreement with statements such as "Teachers know a lot more than students they shouldn't let students figure things out for themselves; It is the teachers' job to explain, to show students how to do the work and assign specific practice." It is possible that in completing the questionnaire Roslyn had not spent a lot of time consciously reflecting on the responses chosen. This further supported the importance of using multiple sources of data.

The various observation data collected–the qualitative field notes, observation checklist, and video recorded data–suggested that her actions were guided predominantly by teacher centered philosophy of teaching. From the video evidence, several patterns of a dominant teacher-centered approach emerged. For example, in lesson one, Roslyn read from the PowerPoint slides, explained the notes on each slide, and instructed students to copy the information from the slides to their notebooks. In the second and third lessons observed, she showed videos, followed by a series of recall level questions and provided explanations for the contents of the videos. These behaviors reflected the teaching style described by Grasha (1996) as the teacher as expert who is concerned with transmitting information and ensuring that students are well prepared. This reflected a more teacher-centered philosophy of learning (Ravitz et al., 2000).

Having noted this dominant teacher-centered style of teaching through the observation data and examining her detailed expressions of constructivist pedagogy during the semi-structured interview, Haynes-Brown wanted to understand how Roslyn would interpret her actions in the videos and whether she would become aware of the inconsistencies through her engagement in the video elicitation interview. This process required a non-threatening atmosphere where Roslyn would feel free to interpret her actions. Allowing Roslyn to choose the segments of her videos and talk about how she perceived them to be aligned with her beliefs was considered useful in accomplishing this.

In the video elicitation interview, Roslyn was asked to give her opinion of her lessons in terms of her pedagogic orientation in teaching with technology. She stated that she believed her use of technology in her lessons reflected student-centered beliefs: "It is student-centered because by using the animation [in the videos], you are actually holding the students' interest and they are learning at the same time." No seeming discomfort was noted in the observation field notes collected during the elicitation interview concerning Roslyn's body language. As the interview progressed, Haynes-Brown proceeded to ask her to indicate other sections of the video recordings (lessons 1, 2 and 3) that she felt reflected her learner-centered beliefs. This was a useful strategy to employ in the video elicitation interview because it allowed Roslyn to make a conscious reflective decision about her interpretation of her actions instead of the researcher imposing her view of what actions should be the focus of the conversation. Roslyn selected a segment from the video recording of the first lesson where she was explaining the notes on a slide with an animation of a burning building (see Fig. 2).

The researcher asked her to reflect on the segment chosen and to talk about her use of technology and the extent that she felt her use of technology was consistent with her learner-centered beliefs. Roslyn stated.

Fig. 2. Screenshot of video segment selected by roslyn during the video elicitation interview.

It is consistent. I have always liked technology because I am a cartoon fan, so I like the visual. Most of the kids these days you have to give them something that capture them through the eyes and then after that we try to stimulate the brain.

She explained further: "it was a student-centered approach because using the motivation point like the animation you are actually holding the student's interest and they are learning at the same time." This explanation was not associated with any of the specific principles of learner-centered teaching that she had expressed in the semi-structured interview. In that semi-structured interview, she stated that: "by doing more work on your own you realize that you develop a skill that requires you to think, analyze, interpret. […] By giving students challenges like that, you are able to develop their thinking skills". Roslyn was asked to show another segment that she had selected, this time she chose a section of one of the videos where she was engaged in a question-and-answer discussion following a video that she had played in class. She explained that the video was effective because students "could see how it would turn out for someone who did not come to work on time against someone who did come to work on time." In exploring this explanation further, the researcher asked Roslyn if she felt that her use of technology was a reflection of her beliefs. Roslyn replied, "Yes, it is a reflection of my beliefs because to me students want to see and like to be demonstrated to." This was in sharp contrast to previously stated belief that students should be allowed to figure things out for themselves. Roslyn's explanation of her actions in the videos suggested that to reduce the inconsistency between her beliefs and observed practices she had changed the cognition about her action. Without the video-elicitation interview Haynes-Brown would have potentially missed this opportunity to understand the thinking behind Roslyn's use of technology and her attempt to reduce the inconsistency by presenting a rationale for her action that countered her previously stated belief.

1.5.2. Frederick: the learner-centered case

During the semi-structured interview Frederick expressed a predominantly learner centered belief that corroborated statements selected on the quantitative questionnaire. He considered himself a technology advocate, who researched new resources and often secured the support of his principal in purchasing new technology: "I don't want to boast, but I think I was the catalyst for some of this change …. being the person who introduced the actual teaching of lessons using technology." He stated that he was making a conscious effort to change his classroom practices from being teacher-centered to more learner-centered through his use of technology, "for the most part, [students] are the ones who are actually doing. So, I am trying to move away from

the teacher centered learning to a more student-centered learning approach". Frederick also expressed a belief that the learning process should allow for hands-on learning experiences and cater to differences in students' learning needs. Coupled with this learner-centered espoused belief, Frederick believed that the teacher's primary role is to be a facilitator: "The teacher must be there to guide, but not to be on the stage, I'm just there to be a facilitator and so, when you plan the lesson, and you give activities you are there to guide." Frederick's comments during this semi-structured interview suggest that he was knowledgeable of the concepts associated with learner-centered pedagogy. Frederick also believed there was a clear distinction between his teaching style and that of his colleagues. He stated that the way other teachers use technology "is a big problem" and that "the difference is they are teacher-centered, I am student-centered and so I am trying to get more student-centered."

Considering that both the questionnaire and semi-structured interview data had corroborated a learner-centered philosophy, Haynes-Brown engaged in the collection of the observation data with the expectation that these learner-centered practices would be on display. However, when his actual use of technology in the classroom was observed, his teaching style did not appear to be as learner centered as he believed it was. In the lessons observed, the students played a predominantly passive role in his lessons. Technology was used mainly for the presentation of content. Students' participation was predominantly through providing responses to recall level questions that he posed. Rather than allowing students to participate in their own learning, Frederick attempted to do the work for them. For example, in one lesson, he posed a question from a past examination paper. When the students were hesitant to respond, he instructed them to write the response he dictated starting with "if they ask you for […] you answer them like this […]" Similarly, in the second lesson observed, a student answered a question incorrectly. Rather than passing the question to other students, he explained the concept. He also supplied responses to the questions and explained how he arrived at his answers. These examples showcase how his teaching demonstrated teacher-centered practices.

In this instance Haynes-Brown was even more intrigued to understand the thinking behind Frederick's teacher centered practices. It was evident that Frederick had a good understanding of learner centered pedagogy, was very knowledgeable of how to use technology, had access to a variety of resources and more importantly had stated in the semi-structured interview that he was making a conscious effort to "move away from teacher centered practices." Haynes-Brown was again cognizant of the potential threat that may be caused if the video-elicitation interview is not approached carefully. Grasha (1996) posits that teachers tend to engage in defensive strategies when they are faced with events that are perceived as threats to their preferred image of themselves as they strive for consistency. Again, the video-elicitation interview provided a means of mitigating this challenge by allowing the teacher to select the segments of the videos that they considered reflective of their beliefs.

Frederick's initial assessment of his lessons at the start of the video-elicitation interview was that his use of technology was consistent with his learner-centered beliefs because he used technology to cater to learning styles of his students: "It is very consistent because in all my classes I use various things such as music. I also use speakers which is a part of technology for them to listen the sound." Frederick expressed several learner-centered assumptions about pedagogy, for example, he stated that "When you teach you want the students to not only be a vessel absorbing information, but they also need to be responsible for their own learning." Although Frederick was allowed to talk freely about his beliefs, Haynes-Brown noted that he was talking in general terms without reference to any specific aspects of the video recordings of his lessons that he had watched prior to the interview. She then asked Fredrick to show some specific segments of his lessons from the videos where he felt his use of technology reflected his learner-centered pedagogic orientation. Frederick watched segments of the video again and paused for a while (see segment shown in Fig. 3). He appeared somewhat concerned as he now folded his arms, and his facial expression was less animated (field notes). Then he commented that "It is more teacher guided than to say teacher centered."

As he reflected and tried to explain the reasons for his lessons being so "teacher-guided," he cited external demands in his context:

I am strong believer in the constructivist view; however, constructivism isn't necessarily the best thing or approach. Because we have a syllabus to work with and the syllabus is very long and so if you allow the students to take their own time to learn the concept and develop their own meaning of what they are learning then you will not complete the syllabus.

Frederick's statements and body language suggested that he was experiencing cognitive dissonance having watched the videos again and paused to consciously reflect on how his actions aligned with his stated beliefs. Frederick was attempting to reduce the inconsistency between his beliefs and actions by rationalizing that his actions reflected the best possible approach to cover the material required in his syllabus. Without a deliberate focus on allowing Frederick to select segments of the video that reflected consistency between his stated learner centered beliefs and his teaching, it is possible that he would not have realized that he was not teaching in ways that aligned with these beliefs.

1.5.3. Anna: a non-aligned case

Anna was a teacher from the non-aligned case. The teachers from this case were teachers who, based on the analysis of the questionnaire, had indicated more learner-centered beliefs and reported teacher-centered use of technology. Anna was a teacher of Spanish at a school that had adequate technology resources. There was a Bring Your Own Device (BOYD) policy in place and there was adequate Internet connectivity, projectors, and/or SmartBoards or MimioView devices in the classrooms. The adequacy of the resources suggests that access to technology was not an issue that prevented Anna from using technology in learner-centered ways. In previous studies a lack of access to technology resources has been cited as a cause for inconsistencies between teachers' beliefs and use of technology (Ertmer and Ottenbreit-Leftwich, 2010).

In the initial interview with Anna, she espoused learner-centered beliefs that suggested a preference for more student involvement: "I like them to discover on their own rather than I am the one telling them." However, she also noted that she did not think her actions reflected those beliefs indicating that she was aware of the inconsistency between her beliefs and actions, "I don't believe that I'm teaching them the best way. […] I don't believe that what we are doing is necessarily

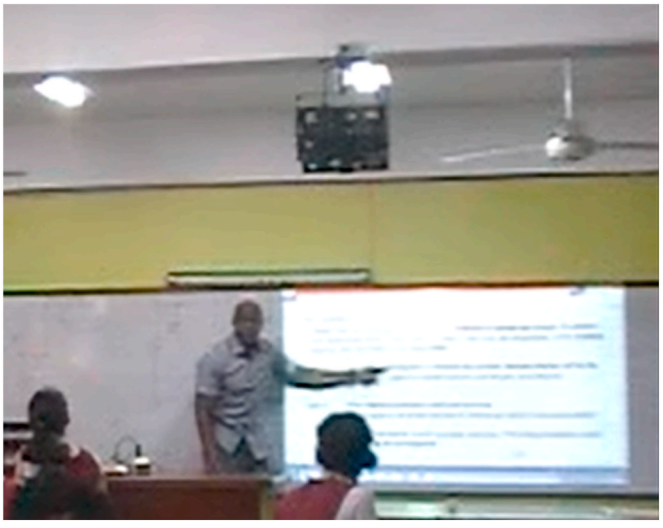

Fig. 3. Screenshot of Video Segment from Fredrick's Lesson that Prompted His Realization that His Lessons were "Teacher-Guided".

the best thing".

In the video elicitation interview, Anna did not seem as forthcoming as other participants to talk about the video recordings of her lessons. She indicated that she had watched the recordings prior to the interview but she was not willing to select a section of the videos that she wanted to talk about. The researcher had to elicit a response by showing a section of video recordings that seemed typical of how Anna used technology in the first recorded lesson to get the conversation started. For the first lesson, Anna mostly used audio-recordings of native speakers to emphasize and practice listening comprehension. The interviewer initiated the conversation about a segment of the video where Anna was using an audio activity. In explaining her use of the audio recording, Anna explained that "It is a language so by using the audio recording students are able to hear the language spoken by natives and by the teacher." Her response was very short and when additional probes were used a general response relating to the benefits of ICT was provided "technology was effective in the fact that it is a language, and we test for skills. So, they are able to understand rather than just seeing the words on the paper."

For the second lesson the researcher selected a point in the video where she was using a PowerPoint presentation. Anna had stated earlier in the interview that she uses PowerPoints for "75–80% of the classes." When Anna was asked to talk about her decision to use PowerPoint in that lesson, Anna explained.

It was another way rather than just giving them the vocabulary on paper this means that in Spanish it helps them to visualize the different things so that it can possible be printed in their mind […] I do believe it [technology] is a means to help them learn.

Ana was then asked whether her use of technology was a reflection of her beliefs about how students learn best, and she responded "Yes. We are in the generation where they are visual learners. Pictures grab their attention, and they are more likely to remember rather than a word written." In this instance, Anna attempted to rationalize her use of technology by adding new elements to reduce the inconsistency (e.g., adopting opinions which fit a behavior) explaining that her use of technology catered to visual learners. Even at this point she was not willing to select any segments from the video to discuss.

The researcher then moved on to the third lesson and selected a longer segment of the video in an attempt to prompt reflection and hopefully get more specific responses. The researcher asked Anna again to reflect on her beliefs compared to her actions in the videos. Anna described her actions as being teacher-centered stating that: "It is more teacher centered because the teacher is the one giving the information. Because of the type of learners that we have we need to incorporate technology to make the lessons come alive and to get them engaged".

Her response revealed that she was aware of her teacher centered teaching style. When she was asked what was preventing her from teaching them in a more learner centered way, her response was related to what she perceived to be challenges within the school context. "An hour or 3 h a week is not a lot [….] I think sometimes students believe that you have to use technology to learn every single thing and so technology sometimes can handicap them. We are slaves to the curriculum in this institution. It's sometimes, it's difficult to incorporate these things [technology]." Anna seemed focused on covering the content from the curriculum and technology was being used to advance this objective. She was aware that her classroom practices were inconsistent with her beliefs prior to engaging in this video elicitation interview. This is potentially the reason for her reluctance to select segments of the video to guide the conversation. As Festinger (1957) stated, some individuals may engage in the use avoidance strategies to reduce dissonance.

1.6. Discussion

The videos provided evidence that the teachers were engaging in more teacher-centered practices supporting the views of Mayne and Dixon (2020). In Roslyn's case, the video elicitation interview provided a mechanism to observe her cognitive response to video evidence that showed her teaching to be more teacher centered than her stated learner centered beliefs. According to Covey (2009), it is difficult to distort the reality of the behavior and since the behavior already happened it is more likely that the individual will attempt to change the cognition about the belief since it is more fluid. This was evident in Roslyn's case as she rationalized her actions presented in the videos. Fredrick's video recorded lessons also presented contrary evidence to his espoused beliefs. In his case, he reduced the importance of constructivist-oriented teaching that is central to learner centered pedagogy that he initially espoused in order to alleviate his discomfort (Covey, 2009; Marshall, 2007) in identifying his own practices as more teacher guided. Osterman and Kottkamp (1993) explain that even though our ideas about teaching might change, we continue to behave in old ways because behavior is habitual and as adults we seldom consciously focus on our behaviors. It is possible that it was only when Frederick participated in the video elicitation interview that he had an epiphany and became aware of the inconsistencies between his beliefs and actions. Finally, Anna gave short and general responses throughout her interview. As a result, the interviewer had to select segments of the videos to start the conversation, prompt reflection, and get more direct responses targeting how her beliefs aligned with her actions. When she was presented with video evidence that confirmed her initial conclusions, she attempted to reduce the inconsistency by adding new elements in explaining her use of technology (Covey, 2009) stating that it catered to visual learners and that her use of technology got the students engaged.

The teachers in this study initially indicated that they had an accurate understanding and self-identified use of learner-centered pedagogy (see Dunn et al., 2004; Ravitz et al., 2000). However, the video elicitation interviews provided better contextual evidence (Henry and Fetters, 2012; Liebenberg, 2009) and a mechanism to reflect on that understanding and practice beyond a traditional interview discussion (Bagnoli, 2004, 2009, 2009; Nico, 2016). The video elicitation not only aided in teachers' recall of their instructional practices but also reflection on the disconnect between their stated beliefs and actual practices (van Braak et al., 2018). Without the video elicitation interview, the researcher would not have an understanding as to why the teachers' stated beliefs were inconsistent with their actions and how this could potentially be addressed. Cohen and Sherman (2014) contend that defensively rationalizing one's actions to reduce dissonance can be a barrier to change. The videos used in the interviews provided another layer of data but one that, through the use of the videos for elicitation purposes, participants were asked to interpret and evaluate (cf. Alerby, 2000; Galman, 2009).

6.1. Limitations of the example study

Despite the dearth of guidelines and codes of practice available for visual methods (cf. Bailey and McAtee, 2003; Shannon-Baker and Edwards, 2018), attending to ethical issues and limitations in the example study is still important. It was important to bear in mind how the researcher's potential biases could have impacted the video elicitation interviews (van Braak et al., 2018). This was a limitation in the sample study discussed particularly for the video elicitation interview with the participant who was less forthcoming (Anna). Being aware of these ethical issues Haynes-Brown engaged in peer debriefing prior to conducting the video elicitation interviews. In the peer debriefing sessions, there was a focus on the researcher's general impressions of the teachers' actions and on the interview questions prepared. The peer provided a critical eye, identifying questions that could be viewed as judgmental or leading. After revising the video elicitation interview procedures following the peer debriefing, the interviews were conducted with each teacher. While the findings were framed using the theory of cognitive dissonance, based on the scope of the research, the authors were unable to determine if the teacher's behavior changed

following the data collection.

6.2. Implications for educational psychologists

In the example study highlighted in this article, videos provided more objective visual evidence in identifying inconsistencies between teachers' beliefs and actions. This form of data is important to the field of educational psychology as it advances the discussion on methods that researchers can use to gain more meaningful insights from participants on their stated beliefs and perceived practices. It provides the researcher with evidence that can be viewed multiple times from different perspectives to gain a more complete and balanced interpretation of the data. It is not enough for researchers to use implicit measures as is common to the field of psychology (Harms and Luthans, 2012) to explore drivers of actions. If the drivers of action are implicit, then actions must be observed and reflected on (Argyris and Schön, 1974).

Although the researcher may offer valuable insights in interpreting the participants' actions, it is even more powerful when the participant is given an opportunity to consciously reflect on their beliefs and actions. As illustrated in previous studies, visual evidence reveals how participants construct their own identities in relation to others (e.g., Bagnoli, 2004, 2009; Shannon-Baker, 2015) and provide data to investigate specific moments from observed phenomena (Henry and Fetters, 2012; Liebenberg, 2009). Research aimed at understanding psychological constructs such as cognitive dissonance is challenging because the construct is not easily measured and identified (Fried and Flake, 2018). It is therefore important for researchers to be aware of varied methods of unearthing these unexamined qualities of our cognitive and affective state to make predictions about future behaviors. Video elicitation presents an opportunity for individuals to see themselves in action, reflect on those actions, and identify ingrained beliefs.

6.3. Implications for mixed methods researchers

This study also has implications for mixed methods researchers' use of visual methods. This study expands previous conceptions of visual methods in mixed methods research (cf. Shannon-Baker and Edwards, 2018) to include video observation data and video elicitation methods. This study demonstrates how video observation and elicitation can be used for initiation reasons in a mixed methods research study (Greene et al., 1989). In the study presented in this article, integrating video data provided divergent data that contradicted teachers' stated pedagogical practices. This contradiction was identified during comparative integration analyses during the mixed methods case study phase. The videos provided another perspective into teachers' actual practices (Greene et al., 1989). Without the use of video data, such divergent findings and the identification of teachers' response to seeing this contrary evidence would not have been possible.

Additionally, whereas other researchers have used visual methods to help participants engage in difficult or negative experiences from their past (e.g., Rule and Harrell, 2006; Shannon-Baker, 2015), this study also demonstrates that visual methods can also prompt cognitive dissonance when observed behaviors do not match one's espoused beliefs. Video elicitation offers an opportunity to recall and reflect (van Braak et al., 2018) on specific events, practices, ideas, and other elements represented in diverse data sets in a mixed methods study.

7. Conclusions

This article supports the rigor and necessity of using video elicitation methods in expanding and documenting previously known understanding of a phenomena. Our discussion centered on an example study about teachers' beliefs and use of technology in the classroom. This study integrated video recordings of teachers' lessons with video elicitation interviews and quantitative questionnaire data on their use of information and communication technology. As a result of integration, their video data provided divergent perspectives on their observed practices compared to their stated beliefs. Future research on the use of video elicitation in research about beliefs versus actions can consider using this visual method over a longitudinal timeframe to see if the use of video elicitations prompts change in beliefs and/or actions.

Credit author statement

Tashane Haynes-Brown: Conceptualization, Methodology. Tashane Haynes-Brown and Peggy Shannon-Baker: Writing- Original draft preparation, Visualization, Writing - Review & Editing. Tashane Haynes-Brown: Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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