Using a Web-based Video Annotation Tool in Pre-service Teacher Education: Affordances and Constraints

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Abstract
Teacher educators and researchers agree that while video has long been used in teacher education, with the recent developments in web-based technologies, it has more to offer for extending learning to teach. This qualitative study explores the affordances and constraints of using a web-based video annotation tool to analyze microteaching practices from the perspective of pre-service teachers studying at the English Language Teaching Education Program of a university in Istanbul, Turkey. For the purpose of the study, a cohort of 32 pre-service English language teachers (F: 27, M: 5) carried out 25-minute microteaching lessons which were video-recorded. Each pre-service teacher annotated microteaching video of his own and his peer using VideoAnt which is a tool for creating text-based annotations integrated within the timeline of a video hosted online. The pre-service teachers' views and experiences were elicited through reflective writing. Thematic analysis was used to analyze the obtained data. The findings showed that although pre-service teachers reported several affordances, they reported a few constraints of the tool. In this paper, the affordances and constraints emerged will be reported and discussed thoroughly.

Keywords: video annotation, pre-service teacher education, microteaching

Introduction

Videos have become an essential learning tool in teacher education as an effective way of capturing and reviewing student teachers' presentations or microteaching lessons (Broady & Le Duc, 1995; Kleinknecht & Gröschner, 2016). Advances in technology such as web-based video annotation tools have offered new possibilities for the use of video in teacher training as they help pre-service and in-service teachers in reflecting on their own teaching and learning experiences (Rich & Hannafin, 2009). However, in spite of the valued position of video in teacher education and significant innovations about video annotation tools, relatively little research has been carried out on the affordances and constraints of using web-based video annotation tools to analyze microteaching lessons in pre-service teacher education, especially in English language teacher education programs (ELT). To fill in this gap and investigate the potential of web-based video annotation tools in language teacher education, the current study explores affordances and constraints of using VideoAnt, a web-based video annotation tool, to analyze microteaching lessons from the perspective of preservice language teachers.

Video Annotation Tools in Teacher Education

Video annotation tools are described as "online and offline programs that allow a user to mark portions of video and reflect on it by adding written, spoken or visual comments to that section of video" (Rich & Trip, 2011, p. 16). The emergence of video annotation tools has enabled teachers not only capture but also analyze video recordings of their teaching actions and their impact on student learning. As put forward by Rich and Hannafin (2009), video annotation tools enable "teachers to review, analyze, and synthesize captured examples of their own teaching in authentic classroom contexts" (p. 53). Due to the fact that student teachers generally have little opportunity to teach in real classrooms, microteaching has been extensively used in teacher education programs across the world to provide student teachers the opportunity to gain some practical experience within a controlled environment during their university courses. In this vein, teacher educators have begun to use video annotation tools in their practice-based courses to enable student teachers observe and analyze their microteaching lessons.

According to Norman (1988), affordances are "opportunities for actions; the perceived and actual fundamental properties of technologies that determine the usefulness and the ways they could possibly be used" (p. 9). Kirschner et al. (2004) identified the affordances of electronic collaborative learning environments into three categories: technological, social and educational. They described technological affordances by the usability which is "concerned with whether a system allows for the accomplishment of a set of tasks in an efficient and effective way that satisfies the user" (p. 50). Social affordances are described as properties of the online learning environment which make social interaction possible. Educational affordances are referred to as "characteristics of an artifact that determine if and how a particular learning behavior could possibly be enacted within a given context." (p.51)

An overview of the related literature on the affordances of video annotation tools shows that these web-based tools are found to be enabling teachers to observe and analyze their teaching and enhance their reflective practices due to the fact that

through these tools teachers are able to link their reflections to evidence (Bryan & Recesso, 2006; Rich & Hannafin, 2009; Sherin & van Es, 2005). McFadden et al. (2014) investigated the use of video annotation as a tool for enhancing reflective practices for beginning secondary science teachers who were enrolled in an online teacher induction course. Their findings indicated that VideoAnt afforded beginning teachers a mechanism to reflect directly on their classroom practices and supported the reflection-on-action. Ellis et al. (2015) conducted a research on the use of VideoAnt by beginning in-service secondary science and mathematics teachers. Their findings suggested that VideoAnt was an effective means to facilitate self-evaluation. Yet, their findings also indicated that in the case of lack of additional scaffolding, peer feedback usually involved praise and agreement. More recently, McCullagh and Doherty (2018) explored the experiences of using VideoAnt during microteaching seminars in primary science. Based on their findings, they suggested that the interactive features of VideoAnt enabled pre-service teachers to have a more detailed and consistent analysis of their teaching. They highlighted the potential of VideoAnt coupled with microteaching as an effective way to develop reflective thinking skills of pre-service teachers.

Method

This study employed the qualitative research design and data collection methodologies to explore the affordances and constraints of a web-based video annotation tool, namely, VideoAnt, in language teacher education from the perspective of student teachers. According to Creswell (2012), a qualitative study is "an inquiry process understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in natural setting" (p.2).

Research Context and Participants

This study was carried out in an ELT program at a university in Istanbul, Turkey during the fall semester of the 2017-2018 academic year. Data were collected from thirty-two ELT students (27 F, 5 M) whose ages ranged from 20-25. They were taking Listening and Speaking in Teaching English as a Foreign Language (TEFL), a course which was offered in the third year of the teacher education program with the aim of helping student teachers extend their knowledge and skills in techniques used in teaching listening and speaking to English language learners at all levels of proficiency. Participants were selected based on convenient sampling and participation to the study was on voluntary basis. They were informed about the fact that they were free to opt out at any stage during the research processes. For ethical considerations, pseudonyms will be used for each student teacher in reporting the findings of the study.

Data Collection Procedure and Analysis

At the beginning of the term, all student teachers attended a one-hour workshop on how to use VideoAnt given by their course instructor. As part of the course requirements, each student teacher carried out a 25-minute video-recorded microteaching lesson during the term. The course instructor uploaded the microteaching videos on VideoAnt and asked student teachers to watch their own

video recordings and annotate them under the following categories established by the course instructor: i) Giving instructions ii) Eliciting responses iii) Giving feedback and iv) Other. Following the self-annotations, all student teachers were placed in cooperative pairings and were invited to watch and annotate the microteaching video of their pair to share formative feedback with him/her. Eventually, they were expected to return to their own microteaching video and read feedbacks received from their cooperative pairs.

Data for the study came from a reflective writing activity that required student teachers to write a reflective essay and share their views on and experiences about the use of VideoAnt incorporated into one of their departmental courses. The student teachers were informed about the fact that there was no right/wrong or expected answers. Data analysis was carried out following a thematic analysis (Braun & Clarke, 2006). The reflective essays were read several times in order to first develop a general understanding of the data and then to find the patterns that emerged from the data set. The patterns which were in the form of chunks were first coded and later labeled under main themes. Direct quotations were used to back the interpretations made by the researcher and to support a vivid portrayal of the reflections shared by the participating student teachers.

VideoAnt

VideoAnt, a free web-based video annotation tool created by the University of Minnesota, enables users the ability to add time marked text annotations to uploaded videos. In addition, other users such as peers or instructors can add annotations on the same videos. The video playback and annotation sections are separated visually so the user is able to view the video and the annotations at the same time. An example of a student teacher reflection using VideoAnt is given below.

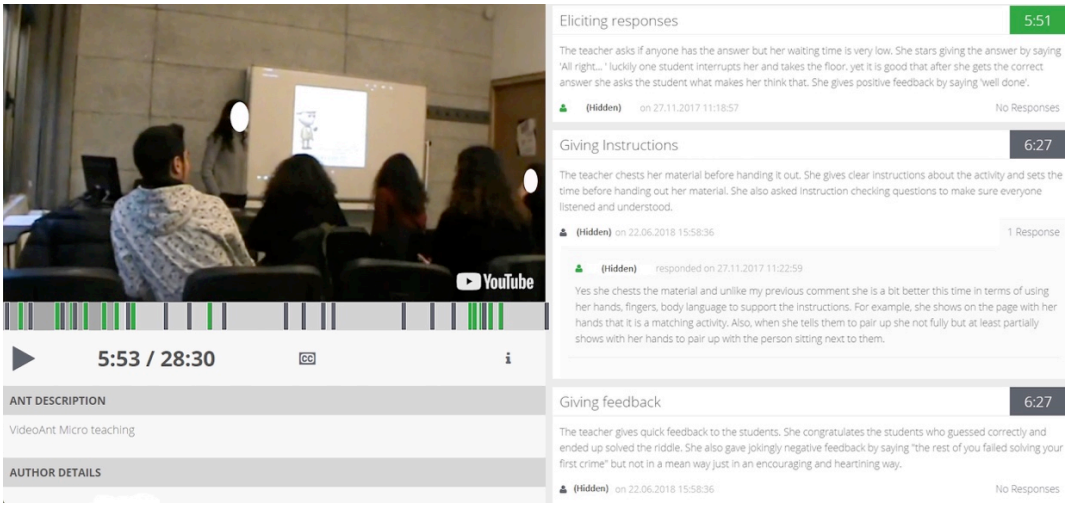

Figure 1. Example of a student teacher reflection using VideoAnt

Findings

The purpose of the present study was to explore affordances and constraints of using VideoAnt, a web-based video annotation tool, to analyze microteaching lessons from the perspective of preservice language teachers. The analysis showed that student

teachers' experiences regarding VideoAnt were largely positive. The student teachers overwhelmingly agreed that VideoAnt was effective in learning to teach and therefore they considered VideoAnt to be an appropriate tool to support their learning. Although student teachers mentioned various affordances of VideoAnt, they mentioned very few constraints. The affordances and constraints emerged in the data are described and illustrated with supporting quotes taken from the data below.

Affordances

The findings regarding the affordances of VideoAnt are presented under the following themes: (i) noticing strengths and weaknesses (ii) facilitating self and peer evaluation (iii) improving quality of feedback (iv) enhancing reflection (v) providing new perspectives (vi) providing encouragement for professional development.

Noticing strengths and weaknesses

The student teachers reported that what they valued the most was the opportunity to notice their strengths and weaknesses regarding the teaching practices they did during their microteaching lessons. They expressed that doing annotations enabled them to notice the stronger and weaker points in their teaching actions. For instance, one of the student teachers stated that "I was able to observe myself and see my strengths and weaknesses." (P 14). Similarly, another student teacher commented that "Video annotation helped me to understand what I am doing wrong or what's missing." (P 4).

Acknowledging the difficulty of noticing and identifying their teaching behaviors and their impact on relevant learning situations at time of their microteaching lesson, student teachers mentioned that they enjoyed the opportunity to watch and re-watch their microteaching lessons while doing annotations. The student teachers expressed that the most useful feature of VideoAnt was that one can stop, pause and rewind the videos. This feature of the tool was reported to be enhancing their noticing and their ability to recall back what occurred during the microteaching lessons.

Some student teachers specifically compared writing a reflection paper on their microteaching based on their memories and reflecting on their microteaching through VideoAnt. The use of VideoAnt was cited as being more efficient in noticing strengths and weaknesses as it enhanced the quality of the reflection. The claim was that they relied mostly on their general thoughts and feelings while writing a reflection paper without watching their microteaching lessons. However, to annotate their microteaching lessons through VideoAnt they had to watch their microteaching lessons, and this was hugely beneficial as it afforded them to base their reflections on their strengths and weaknesses they noticed rather than what they remembered. For instance, one of the student teachers stated:

> I did a micro teaching in my second year. In that course, I wrote a reflection paper. I don't believe that writing reflections pages and pages doesn't help much because generally, we talk about general thoughts and feelings. In the video annotation task, I clearly noticed my strong and weak sides. This is more valuable than writing a traditional reflection paper. (P 27)

Facilitating self and peer evaluation

VideoAnt was considered to facilitate both self and peer evaluation. Many student teachers described the value of being able to annotate their own microteaching lessons through VideoAnt. Doing annotations afforded the opportunity of observing their teaching behaviors in an objective way. For example, one of the student teachers stated that "The video annotation is an effective way to observe and evaluate myself in an objective way." (P 19). Another student teacher brought up the importance of using the categories given by the instructor to reflect on the microteaching lessons while doing annotations. She noted that these categories guided her to focus on the learning opportunities arose. She stated that "I evaluated myself according to the theoretical criterion most of the time. It helped me to focus on where to improve rather than thinking that my lesson was just bad." (P 5).

The analysis also revealed that student teachers found VideoAnt to be useful in peer evaluation as they considered reading and responding to peer feedback an effective way of learning to teach. They noted that peer feedback received through VideoAnt offered them the opportunity to learn from each other. For instance, one of the student teachers reported that "Video annotation was beneficial not only for evaluating my micro but also for evaluating my peer's micro. When I watched her video to annotate and read her comments to respond, I learned from her as well." (P 3). Similarly, another student teacher commented that "It was a good opportunity to annotate my pair's video because thanks to it, I was able to compare the things we did in our micros. We learned from each other's mistakes. That's why video annotation enriched my learning." (P 14).

Improving quality of feedback

The use of VideoAnt was considered to be helpful in improving quality of feedback. It is a well-known fact that videos offer observable evidence of teaching practices. Additional to providing observable evidence, the student teachers noted that video annotation was valuable for providing opportunities of synchronizing feedback at precise points in microteaching video segments. The most commented aspect of VideoAnt regarding improving the quality of feedback was that it helps users to identify the exact point that the feedback is given on. For instance, one student teacher reported that "Through VideoAnt we were able to see which part of the video the feedback is given on. Hence, the feedback is given in detail." (P 17). Likewise, another student teacher stated that "Being verbally informed is important but it is hard to visualize the feedback you receive. VideoAnt helps you to see the particular act that you received feedback on." (P 14).

The student teachers found receiving and giving feedback through VideoAnt more helpful than receiving and giving feedback through reports because video annotation made the feedback they receive and give more concrete and contextualized. For example, one student teacher highlighted that "It is always better to see what someone is referring to in a comment. With the video annotations, the person who is reading will have a clearer understanding about what I am trying to tell compared to a report which requires the reader to imagine what s/he is reading on the report." (P 32).

Enhancing Reflection

A majority of student teachers mentioned that doing video annotations helped them not only to think critically on their teaching acts but also on looking for alternative teaching decisions that could have been given. The facility to indicate the exact moment the annotation is being done was seen as a contributing factor to improving the quality of the reflections. For example, one of the student teachers claimed that "The video annotation serves as a prompt for the students and it helps reflection as it urges you to watch your teaching performance critically." (P 20). Similarly, another student teacher reported that "You can pause the exact same second to write an annotation and the whole process that follows writing an annotation pushes you to really think critically and probe the reasons behind your acts and how it is right or wrong depending on the situation." (P 7).

A number of student teachers reported that video annotation improved their quality of reflection as "It helps students become aware of not only their teaching but also makes them consider possibilities of teaching styles". (P 16). This was seen as a way of doing a close analysis of the teaching actions and challenging student teachers to trigger their teaching repertoire to articulate what other possible teaching actions could have been considered.

Providing New Perspectives

Though not as frequent as the previous affordances mentioned above, another affordance mentioned by student teachers was providing new perspectives. The video annotation experience was found to be helpful as it provided student teachers to distance themselves from their own teaching actions and observe themselves from a different perspective. Acknowledging the fact that a perspective shift is necessary for reflecting on one's teaching, student teachers enjoyed being able to see themselves from the eyes of the students with the help of video annotation task. For instance, one student teacher stated that "The video annotation was helpful. I got the chance to observe myself from another perspective. I was not the presenter, but I was an observer." (P 20). Similarly, another student teacher reported that "When I did annotations on my own video, I was able to see myself from the students' perspective." (P 27).

Providing Encouragement for Professional Development

The student teachers considered annotating their microteaching lessons through VideoAnt as a source of encouragement for professional development as video annotation helped them to realize the progress they have achieved and about to achieve. The facility of providing self-evaluation made student teachers feel competent in and confident at analyzing their own teaching actions and therefore it created a feeling of improvement in teaching. For instance, one of the student teachers stated that "The whole video annotation task made me realize that I can getter at teaching." (P 4). Likewise, another student teacher commented that "During the annotations task, I was busy with analyzing myself with full concentration and this made me feel more comfortable and confident as I became able to figure out my mistakes on my own." (P 10). Similarly, another student teacher touched upon the same affordance and stated that "I saw that I can also be the person to guide myself.

This fact gave me confidence and I began to believe that I am able to better my teaching." (P 20).

Some student teachers especially valued the peer feedback they received as a source for encouragement. These student teachers expressed both their satisfaction from the fact that VideoAnt makes receiving peer feedback possible and thus creates a ground for peer support which in turn boosts confidence. For example, one student teacher mentioned that "Using VideoAnt was helpful to feel more confident after receiving peer feedback. I clearly understand that having enough experience will be helpful for becoming the teacher I want to become." (P 2).

Constraints

Compared to the affordances of VideoAnt, student teachers mentioned a few constraints of the tool. The most reported constraint was that the tool cannot be used without internet connection. As one of the student teachers mentioned that "The only bad thing was that you need internet connection, but we need that almost for all out of class assignments." (P 32).

A problem brought up was that some student teachers had difficulty in forwarding and rewinding the video during the annotation process. These student teachers found their own ways to overcome this difficulty. To give an example, the following quote shares the solution found by one of the student teachers who faced a difficulty with the use of timeline during the annotation process.

> The only bad side was forwarding and rewinding of the video. It wasn't that useful because when I annotate two parts of the video that are close to each other in timeline, rewinding back to in between those parts was impossible. Thus, at times I had to delete what I had written at last and then I wrote the middle part and then rewrote the part I deleted. (P 7)

Conclusions

The most crystalized finding of the study is that the student teachers commented mostly on affordances i.e. their positive experiences and perceptions toward the use of VideoAnt. This shows that student teachers found video annotation to be a valuable activity for their learning. Specifically, they reported the following affordances: (i) noticing strengths and weaknesses (ii) facilitating self and peer evaluation (iii) improving quality of feedback (iv) enhancing reflection (v) providing new perspectives and (vi) providing encouragement for professional development. Compared to the affordances, student teachers mentioned a few constraints of the tool. The most reported constraint was that the tool cannot be used without internet connection. Another difficulty brought up was that some student teachers had problems about forwarding and rewinding the video during the annotation process.

The findings of the study are in line with the previous research which indicated that VideoAnt is of value in teacher education as a tool to develop student teachers' reflective thinking and teaching skills (Ellis et al., 2015; McCullagh & Doherty, 2018; Kleinknecht & Gröschner, 2016; McFadden et al., 2014; Rich & Tip, 2011). Given the fact that the core of teaching "is learned through continual and systematic analysis

of teaching" (Hiebert et al., 2007, p.49), it is of great importance to offer student teachers the opportunity to analyze and refine their teaching skills before they enter the teaching profession. The findings of this study encourage the use of web-based annotation tools in pre-service teacher education due to technological, educational and social affordances they offer.

Although this case study provides valuable information gathered from the perspective of the student teachers about the affordances and constraints of VideoAnt, it is important to note that the findings should be viewed with caution. First, the participants were selected by convenient sampling. Second, this study illustrates the use of VideoAnt in one educational context. Therefore, more research on the use of web-based annotation tools in different teacher education programs are needed. Finally, the data obtained illuminates only the experiences and perceptions of student teachers. Therefore, student teachers' actual learning through the use of VideoAnt is worthy of further consideration.

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