(Eye) Tracking professional learning in language teacher education. (work in progress)

Joanna Baumgart

Stiftung Universität Hildesheim; baumgartj@uni-hildesheim.de

The proposed study focuses on the investigation of the impact of video viewing on professional learning of English language teachers. The primary research aim is to evaluate the impact of different types of video formats on professional noticing and engagement with reflective practice of pre-service teachers. To this end, a triangulated methodology will be used in terms of participants (novice vs experienced teachers), data sets (eye tracking data, Think Aloud protocols, diaries and portfolios, questionnaires, interviews) and data analysis approaches (qualitative and quantitative including corpus linguistics). This will strengthen the proposed study and make it unique given the current paucity of research in language teacher education employing different formats of classroom videos where eye tracking is combined with more traditional methods of investigating teacher learning.

1 INTRODUCTION

Teaching is a complex and challenging undertaking which encompasses a myriad of factors beyond professional knowledge and competences (Coffey, 2014). Consequently, preparing students to embark on their teaching career is an equally difficult task; thus, gaining better understanding of how teachers learn continues to be one of the key themes in teacher education. Indeed, teacher learning supported by video viewing has become an accepted standard, a choice "artifact of practice" which creates a link between university course theory and classroom practice (Gaudin & Chaliès, 2015), across subject areas, levels (primary, secondary,3rd level education) and countries. Current advances in technology, such as 360 videos and their viewing in VR headsets, create opportunities to further explore the potential of this medium in teacher education while methodologies such as eye tracking allow us to trace processes of teacher learning to an even greater degree. This extended abstract presents a proposed post-doctoral study focusing on two aspect of language teacher learning, professional noticing and reflective practice, in the context of viewing different video formats.

2 THEORETICAL PERSPECTIVE

The following section summarises key theoretical perspectives which inform the proposed study.

Research on teacher learning is extensive and has been one of the key foci of educational research for decades. On the one hand, teacher learning has been examined on a macro-level in terms of the overall paradigm implemented. Thus, we can distinguish: cognitive approaches which treat knowledge as a set signs manipulated in the mind of an individual where learning simply involves acquisition of these signs (Putnam & Borko, 2000); sociocultural and situative perspectives whereby cognition is inherently social and both the process of learning (how) as well as its specific context constitute the

fundamental part of what is learnt (Putnam & Borko, 2000; Vygotsky, 1978); and, finally, conceptualisations which encompass both cognitive and sociocultural aspects (Edge, 2002). On the micro-level, on the other hand, teacher learning has been examined through analysis of teachers' reflections (Farr & Farrell, 2017; Farr & Riordan, 2015; Farrell, 2013; S. Walsh, 2011; S. Walsh & Mann, 2015) and through teaching self-efficacy (Carney, Brendefur, Thiede, Hughes, & Sutton, 2016), to name just some examples.

In fact, reflective practice, originating in the work of Dewey (1910, 1916, 1933, 1938) constitutes one of the corner stones of teacher education, including language teacher education. Despite its extensive use in teacher training programmes, reflective practice remains subject to many interpretations resulting in a plethora of frameworks in terms of participants (individual-peer-group), modes (written-spoken-dialogic) and approaches (diary, stimulated recall, video-based etc.) (Akbari, 2007; Farr & Farrell, 2017; Ghaye, 2011; Jay & Johnson, 2002; Mann & Walsh, 2017; Tarrant, 2013; Zeichner & Liston, 2014). Of particular interest to this research project is video-based reflection as it affords "opportunities to develop ways of seeing and understanding professional practice" (Grossman et al., 2009, p. 2065). Specifically, working with videos allows teachers to consciously notice aspects of teaching and to reflect on multiple aspects of classroom practice (Gaudin & Chaliès, 2015; Santagata & Guarino, 2011; Tripp & Rich, 2012). Thus, professional noticing, a confluence of professional knowledge base and selective attention (Kleinknecht & Schneider, 2013), is also a key concept in this study. Research suggests that degree of professional noticing is one of the factors determining success in classroom practice (*ibid*.). Specifically, with view to key aims of the current project, studies in expertise research highlight differences in noticing and interpretation of classroom events between novice and experienced teachers (*ibid*.). However, research results also indicate that pre-service teachers can improve their noticing skills when they engage with video analysis, discussion and reflection on it in a scaffolded and systematic way (*ibid*.). (see also Jarodzka, Holmqvist, & Gruber, 2017; Lachner, Jarodzka, & Nueckles, 2016)

Working with classroom recordings is a well-established practice in teacher education (Borko, Koellner, Jacobs, & Seago, 2011; Sherin, 2004; Sherin & van Es, 2005; Stockero, 2008; Tochon, 2008). Traditional videos of oneself (mostly in the context of micro-teaching) and those of other teachers are often used for analysis of key aspects of classroom practice such as questioning techniques, feedback or classroom management (Kleinknecht & Schneider, 2013). However, use of 360 videos in teacher education is still at a relatively nascent stage. Studies investigating the implementation of 360 videos with pre-service teachers indicate increased sense of situational immersion and presence as well as, most recently, higher levels of professional noticing (Kosko, Ferdig, & Zolfaghari, 2020). This is attributed to one of the key characteristics of 360 videos, namely perceptual capacity which "refers to the medium's capacity for aspects of the scenario to be perceivable, including but not limited to what is potentially viewable" (*ibid*.). Considering the unique affordances 360 videos offer, combining viewing of 360 recordings with eye tracking technology would allow to gain greater insight into development of professional noticing in pre-service teachers.

Eye tracking methodology, already ubiquitous in psychology, usability studies or marketing, is becoming more widespread in educational research and continues to expand beyond the study of reading processes, multimedia learning and mathematics learning (Beach & McConnel, 2019). Using eye tracking to investigate the broad concept of teacher learning, including professional noticing and reflective practice, has the potential to generate insights into cognitive processes and behavioural patterns of teachers (*ibid*.). Expanding our understanding of teacher cognition is of particular importance for teacher education, both in pre- and in-service contexts. Gaining insights into experienced teachers' decision-making and

engagement with the processes of teaching and learning can positively affect sharing and co-construction of knowledge among experienced teachers as well as between experienced and novice teachers (eg.: during school practicum between mentors and trainee teachers) (*ibid.*). Finally, analysis of longitudinal eye tracking data collected among pre-service teachers could potentially help improve teacher education programmes, especially in terms creating a closer link between theoretical and practical components, in order to better fit the developmental path of pre-service teachers.

3 STUDY DESIGN

This section delineates the empirical design of the proposed post-doctoral study.

3.1 Research questions

The proposed longitudinal study has two key aims:
1. To investigate the impact of different types of classroom videos on professional noticing of student teachers.
2. To investigate the impact of different types of classroom videos on how student teachers engage with reflective practice.

The following types of videos will be used in the proposed study: traditional classroom videos, 360 classroom videos viewed on a flat screen, and 360 classroom videos viewed in a VR headset.

3.2 Methodology

The following data will be collected to investigate the research aims.

Aim 1: To investigate the impact of different types of classroom videos on professional noticing of student teachers. (EG= experiment group, CG= control group)

Table 1: Data collection and treatment for research aim 1

Novice English language teachers (key cohort)		
Participants	**Treatment**	**Data elicitation tools**
EG1 student teachers	360 videos with headset	Eye tracking, Think Aloud protocol
EG2 student teachers	360 videos on flat screen	Eye tracking, Think Aloud protocol
CG student teachers	traditional classroom videos	Eye tracking, Think Aloud protocol
Experienced English language teachers (comparison cohort)		
EG1 experienced teachers	360 videos with headset	Eye tracking, Think Aloud protocol
EG2 experienced teachers	360 videos on flat screen	Eye tracking, Think Aloud protocol
CG experienced teachers	traditional classroom video	Eye tracking, Think Aloud protocol

Aim 2: To investigate the impact of different types of classroom videos on how student teachers engage with reflective practice.

Table 2: Data collection and treatment for research aim 2

Novice English language teachers (key cohort)		
Participants	**Treatment**	**Data elicitation tools**
EG1 student teachers	360 videos with headset	Eye tracking, reflective questions and tasks,
EG2 student teachers	360 videos on flat screen	reflective diaries, portfolio entries
CG student teachers	traditional classroom videos	interviews, questionnaire: self-efficacy for RP
Experienced English language teachers (comparison cohort)		
EG1 experienced teachers	360 videos with headset	Eye tracking, reflective questions and tasks,
EG2 experienced teachers	360 videos on flat screen	interviews, questionnaire: self-efficacy for RP
CG experienced teachers	traditional classroom video	

In order to control for the type of video watched, namely video of oneself vs video of another person (REFS), both types of classroom recordings will be used as follows:

1. Videos of other teachers will be viewed by both novice and expert teachers (research aim 1 and 2)
2. Videos of own microteaching will be viewed by novice teachers only (research aim 1 and 2)

The following table summarises proposed data collection points in the student cohort.

Table 3: Proposed data collection points for student cohort.

BA students	Start of BA programme	After 1st year and SPS practicum	After 2nd year	After ASP practicum (between 2nd and 3rd year)	End of BA programme
MA students	Start of GHR300 (2 semesters)	Post microteaching (sem. 1)	At the end of 1st semester	In week 8/16 of school practicum	In week 16/16 of school practicum

4 DISCUSSION

Based on literature review conducted thus far it is predicted that 360 videos will have more impact on teacher noticing and engagement in reflective practice compared to traditional videos. It is further hypothesised that viewing 360 videos using VR headsets will generally have a more significant effect on concepts in question than viewing 360 videos on a flat screen. It is also suggested that the type of video (myself vs others) will be a contributing factor in the engagement with video. Finally, it is also possible that 360 technology, in particular VR headsets, will negatively affect (technology as a potential barrier) student teachers to a lesser extent in comparison to some of the experienced teachers (digital natives vs digital immigrants) (Prensky, 2001).

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