Smartphones as a Support for the Language of Images in Continuing Professional Development

Laura Rayón
Faculty of Education
Alcalá University
Alcalá de Henares. Spain
e-mail: laura.rayon@uah.es

Yolanda Muñoz
Faculty of Education
Alcala University
Alcalá de Henares. Spain
e-mail: yolanda.munozm@uah.es

Ana María de las Heras
Pedagogy Department
UDIMA
Madrid. Spain
e-mail: anamaria.delasheras@udima.es

Antonio Bautista
Faculty of Education
Complutense University
Madrid. Spain
e-mail: bautista@edu.ucm.es

Abstract- **In this paper, we advance some of the results of a study aimed at identifying the contributions of smartphones as a support for multiple systems of representation in continuing teacher training. The participants are three teachers of primary school. The still-image tools on smartphones enable the representation and communication of situations experienced in classrooms using photography. Taking photos of classroom situations that are considered difficult by these teachers, and later viewing these photos to help them reflect on what occurred in the classroom using photo-elicitation processes, enables us to evaluate the possibilities that smartphones offer to represent and communicate meanings, beliefs and ideas on problematic situations using images, while weighing up diverse alternatives for professional action. They further enable analysis of trends concerning the type of image captured and the meanings associated to them.**

Keywords-teacher education; photography; smartphones; photo-elicitation.

I. INTRODUCTION

We need to analyse two basic concepts to understand the functionality of smartphones to represent and communicate the situations experienced in classrooms through the language of images: smartphones as a means of communication based on audiovisual messages, and reflection on teaching practice mediated through photo-elicitation processes.

A. *Smartphones as a means of facilitating communication based on audiovisual messages*

The functions that smartphones offer us simultaneously allow producing audiovisual messages, editing, publishing, and dissemination on the virtual spaces. New forms of communication and social interaction in collective virtual spaces appear in people's lives daily. With this, image comes to the foreground to reveal people's subjective experience. In the same way as a text give us ideas, images give us information about events, people and things. But in particular, they are capable of generating meanings, personal interpretations associated with such representations. In this sense, a picture does not show us the world but different ways of seeing the world. This subjective dimension of images is important for Barthes [1] since it highlights the emotional dimension that photography promotes. He focuses his reflections on the sensations and emotions a photo produces. One's interest in the photo from such a perspective does not reside so much in its aesthetic beauty due to the composition of the elements it shows us, nor in the analogous reality it represents, but in its value in creating, communicating and transmitting the meanings that the photo contains.

The smartphones´ uses and systems of representation promote the visibility of our experiences and our personal perspectives. These devices enable us to share images and, with them, experiences and messages in real time through the different social networks and to reach any part of the world quickly, reliably and efficiently. The anonymous voice of the individual gains in prominence and, in our study, so do teachers' voices when faced with the dilemmas and problems of professional practice.

B. *Reflection on teaching practice through photo-elicitation processes.*

Teachers have a mediating role in teaching processes. This is why helping them understand the determinants of professional practice, helping them represent the situations they experience and allowing them to define the

problems themselves, enables them to weigh up different choices of action and improve their teaching processes. This reflection on practice is key for developing any strategy for innovating and improving teaching. The modelling and transformational role of teachers, and consequently the need for autonomous development of their professional thought, justifies the need for teachers to carry out processes of reflection on their professional practice [2]. Many educators emphasize the critical role of learning through reflective practice in developing teaching capabilities [3] [4] [5].

The novelty in our study is placing a smartphone into teachers' hands so they can record and analyse the difficulties and dilemmas emerging in classrooms and educational centres, previously capturing there significant instants and moments in photos.

In this way, teachers can analyse, question, discuss and reflect on what happened in photo-elicitation sessions. This procedure consists of using photos to communicate people's life experiences [6]. It is a means of narration supported by images through which the thoughts, interpretations and meanings people place on the actions, objects or events represented in the photos are retrieved. The idea is to capture an image of reality to "see through others' eyes" (in this case, the teachers') aspects of this reality and their particular interpretations of the image captured [7].

In our case, given that during classroom activities it is difficult to reflect on professional problems and dilemmas, it is only later through photo-elicitation that the teachers become aware of their beliefs, theories, attitudes and values. This is because, based on the photos they take, they are asked about what the images represent and they provide a narration on what they are doing in class, what they could do and what would be advisable to do. This process forces them to analyse and make their problems and concerns explicit. When the teacher reflects on her practice, she constructs meanings over the realities within which she is working. She becomes involved with a process of observation, interpretation and construction of meanings. Essential processes in the "realization of their activity to the extent that the teacher inevitably makes many decisions, working with objectives and realities that can be interpreted, within complex, fluid settings: something that may not be so decisive in other professions" [8]. From this approach teachers are defined as a professionals who undertake their role in a personal way who give the profession a creative component.

What does a smartphone provide to help teachers record and reflect on these situations? What value does the language of images have in these analytical, questioning and discussion processes on what took place in classrooms and educational centres? What is the nature of the images that teachers take and what discourses do they articulate? We propose that the teachers take photos of situations and moments. This means we focus on the group of tools for taking still images that these devices have.

II. THE AIMS AND RESEARCH METHOD

The aims proposed to reveal how the language of images contributes to reflection on teaching practice are:

- Understanding how teachers use their smartphones to communicate using the language of images.
- Describing and make connections between the photos´ content and the teacher´s reflections that arise in the photo-elicitation sessions.

To meet these aims, we developed three types of procedures:

Photo-elicitation sessions. These sessions were conducted once every two weeks during three years. Before the sessions teachers take photos of events, tasks, dilemmas, conflicts, behaviours and so on that they consider most relevant and interesting in the life of their classroom and other spaces in the centre. The photos that each teacher takes are shown and participants comment on the reasons that prompted them to take each photo. After this, the members of the research group formulate questions or doubts on the content of images and the reasons given by the teacher. In this way, images "can offer researchers new and valuable routes to other people´s experiences, knowledge and values" [9].

Audio-reflection sessions. An audio recording is made of the photo-elicitation sessions with two research goals. Firstly, to analyse each teacher's narrations, and secondly, to codify the information provided to place it in context by analysing each photo's content.

Content analysis. To describe how the images and the meanings associated to these photos are used by teachers, according this method [10] [11], we grouped the photos according to their relationship between the internal narrative – what actually appears in the photos and the type of shot or composition – and their external narrative – what the image aims to communicate, the information recorded in the audio-reflection sessions [12]. To codify and sort both information types, we use NVivo 10 software, a programme that provides a flexible, multi-purpose work space, which allows us to create categories for analysis and to access information combining different types of records: text-based and still image, in our case. We understand that the most direct way of knowing these human experiences is to narrate them, rather than to quantify them. Our research strategy is based on the idea that each situation of photo-elicitation is equivalent to an open interview, which does not need a questionnaire, because the questions are oriented from the spontaneous manifestations of the teachers about images of moments in their classrooms.

III. CONCLUSION

Three fundamental aspects have stood out during our research:

Firstly, we verified how the language of images enables teachers to take photos easily to represent their ideas, concerns and problems in classrooms and educational centres. When an unexpected event occurs that activates their thought and a personal interpretation of that event, quick access to the camera app on smartphones makes it possible to record that moment, which is important to them, in a more efficient way than using a classic camera.

It may seem like an obvious question, but in the educational field, Smartphones, which have a great presence in our daily lives, are not as widely used in schools as video and photo cameras. The study is relevant because of the few existing experiences in which smartphones take center stage in the processes of reflection on the teaching practice. This allows them to be aware of their particular professional and ethical attitudes in response to specific problems. The important role that smartphones play in ongoing training and in improving professional practice of these three teachers is clear. For them, smartphones have gone from being a resource whose use was exclusively devoted to leisure, to becoming an important tool for professional development. In contrast to a typical camera, we carry our smartphones on us at all times, and that omnipresence is what helps when recording images. Since they are multi-functional, teachers also have other ways of recording ideas such as taking text and audio notes to record the reasons why they took the photos. Furthermore, in the images the teachers took, we confirmed that the spaces for reflection were not only in the educational centre or classroom; rather, having a device on them to record images allowed teachers to extend their reflective spaces beyond the school environment. Thus, they showed us photos taken in their personal space, such as photos taken at home and in leisure spaces. It is in these spaces that they can also retrieve the photos taken previously and calmly continue to build meanings and ideas. But in addition, smartphones allow to capture the immediacy. It also allows to capture the significant moment of an event or anecdote for the teachers, in a more effective way than if they used a camera of photos. The practical thinking of teachers is a difficult question to materialize. The events that are happening in the classroom do not allow the teacher to become aware of the ideas and theory that they use to respond to the problems that arise. The tactile functions of smartphones facilitate this task to make explicit that practical knowledge.

With regard to the second aim, we have seen that close-up photos – showing objects and things – are a type of record that predominates in their representations. We observed that the teachers constructed highly personal, intimate and, therefore, elaborate meanings, and they recognised that it would be difficult to express these without the support of the photos. The language of images appears to be a language for expressing ideas and thoughts that would be more difficult to communicate through written language. The meanings associated with the photos also reveal their ideological position. The use of images reveals a negotiation process regarding their identities as creative teachers who transform their professional practices and conditions, as opposed to a more uncritical and technical role in the teaching profession. In the processes of photo-elicitation the teachers discuss with the researchers alternative actions. These alternative actions are aimed at improving the problems detected. For example, one of the participating teachers is becoming aware of the problems of coexistence in her classroom during the process of photo-elicitation. Competitiveness among students emerges as their form of interaction. This process leads the teacher to implement a behavior modification project in her classroom.

A future line of work could be the inclusion of image and the processes of photo-elicitation such as a pedagogical strategy in initial teachers' curriculum. If the students use a multimodal language, they will improve their skills to observe and analyze critically their contexts and any educational situation.

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