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Using Mobile Eye Tracking Technique in Micro-teaching Practices of Pre-service Teachers

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Contribution

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Various techniques have been utilized to improve classroom management skills of prospective teachers. In recent years, the use of technology in such practices has become widespread. As a matter of fact, teacher trainers and pre-service teachers are known as to be willing to use increasing technological facilities in teacher training (Rienties, Brouwer, & Lygo-Baker 2013). Among them, the eye tracking technique is making its way into the field. In the literature, the eye tracking method studies on experienced and novice individuals in such fields as human-computer interaction (Eghbal-Azar & Widlok, 2013), taxi driving (Borowsky, Oron-Gilad, & Parmet, 2010), air traffic controlling (Hauland, 2003) and monitoring human health in real life conditions (Vidal, Turner, Bulling, & Gellersen, 2012) are available. This method is mostly applied by employing fixed stimulants (text, images, animation and video etc.) (Rayner, Williams, Cave, & Well, 2007; Reichle, 2006; van den Bogert, van Bruggen, Kostons, & Jochems, 2014). Having been practiced actively in diverse fields, the eye tracking technique is used as a method in educational research agenda, as well. For instance, Paulson, Alexander, & Armstrong (2007) used the eye tracking machine for peer review processes while Law, Atkins, Kirkpatrick & Lomax (2004) used it for surgical education. Besides, in the educational context, the eye tracking technique is used for such issues as what learners are focusing on during a class (Rosengrant, Hearrington, Alvarado & Keeble, 2012), social interaction (Ye, Fathi, Han, Rozga, Abowd, & Rehg, 2012) and instructional design (Yang, Chang, Chien, Chien, & Tseng, 2013).

In the literature, there are a number of studies presenting differences between the behaviors of experienced and novice individuals (Gegenfurtner, Lehtinen, & Säljö, 2011; Law et al., 2004). Experienced teachers are expected to process the

information in a faster manner and figure out what is going on inside the classroom in a relatively short time. Accordingly, the number of fixations gathered from the analysis of eye tracking could be interpreted as the indicator of the information processing speed (Gobet & Charness, 2006). Likewise, the present study is believed to contribute to the literature in that it presents the differences between experienced and pre-service teachers in relation to visual domain and classroom management; and it provides suggestions in line with the findings. The aim of this study is to investigate the classroom interactions of pre-service and experienced teachers in an authentic atmosphere by using mobile eye tracking device. Furthermore, it also aims to present differences between pre-service and experienced teachers in terms of visual domain and give suggestions for classroom management.

Method

The convergent parallel design, which is a mixed research design utilizing both qualitative and quantitative research methods, will be employed for the study. Data collection tools which are data from mobile eye tracking device, video recordings of the classes and semi-structured interviews, will be used. Effective classroom management is one of the most important skills for the novice teachers. It is essential to understand the significance of classroom management for the sake of training teachers as effective and qualified individuals (van den Bogert et al., 2014). To that end, in addition to the video recordings of user experiences, which are basically the traditional micro teaching practices, data obtained from the eye tracking was intended to be analysed for the current study. Therefore, without any intervention to the authentic learning atmosphere inside the classroom, classroom management practices of pre-service and in-service teachers of Information Technologies will be analysed with a mobile eye tracking device and a model for micro teaching will be devised for further studies.
A number of methods could be used for the tracking of the eye movements of the learners in a classroom. Traditionally, video recordings of the participants through fixed video cameras, placed at different points in the classroom and all recording synchronously, are analysed by the experts. This method has some disadvantages. First of all, the experts can only estimate where exactly the participants are facing or looking at since they cannot see the exact movements of the participants' eyes and face. Similarly, huge amount of data gathered from more than one video camera constitutes a drawback, as well (Ye et al., 2012). Nowadays, another method, which is relatively new, is used for the same purpose: mobile eye tracking device. Data is recorded through glasses which is equipped with infrared detectors. This device can record not only the eye movements of the participant but also the video of the whole class, thanks to a video camera placed in front of the device.

Expected Outcomes

The main advantage of mobile eye tracking device is the fact that it provides the opportunity to observe the interaction of the participant in question with his or her surrounding or the other people in this authentic learning environment. Hence, this study is expected to explore pre-service and in-service teachers' eye movements in a real classroom and where they focus on, in addition to the sequence of these focusing points. Considering the technologies used in training of prospective teachers, the present study, which will be on the contribution of mobile eye tracking device to trainees' teaching skills, is believed to bring a new perspective towards teacher education, which might lead to an improvement in training of teachers. After the practices that will be carried out within the scope of this study, the following outcomes are expected to be accomplished:
1. To find out interaction patterns, which can be effective for classroom management,
2. To improve teaching skills of prospective teachers,
3. To produce micro-teaching materials supported with eye tracking data, which can be used in classroom management courses,
4. To investigate pre-service and in-service teachers' eye tracking data and to reveal the differences between them,
5. To reveal the usage process of eye tracking device for the purpose of monitoring prospective teachers' classroom experiences and to introduce a new method for micro-teaching.

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