Leveraging Virtual Trips in Google Expeditions to Elevate Students' Social Exploration

Antigoni Parmaxi, Kostas Stylianou, Panayiotis Zaphiris

Leveraging Virtual Trips in Google Expeditions to Elevate Students' Social Exploration

Antigoni Parmaxi, Kostas Stylianou, Panayiotis Zaphiris

Cyprus University of Technology, Lemesos, Cyprus
{antigoni.parmaxi; kostas.stylianou; panayiotis.zaphiris} @cut.ac.cy

Abstract.
This paper reports on an exploratory case study on the use of Google Expeditions in the context of an intensive Greek language course for specific academic purposes. Google Expeditions are collections of linked virtual reality content that can enable teachers to bring students on virtual trips to places like museums, human anatomy, surgical processes etc. Thematic analysis of instructors' field notes, students' reflections, interviews and focus group was employed aiming at identifying the potential of Google Expeditions for extending the language classroom through virtual trips. The use of Google Expeditions enabled students to extend the borders of the classroom by making virtual walkthroughs in places that would normally be unreachable and trigger social exploration through inter- and extra-VR communication, sharing of ideas, concepts and experiences. This study acts as a pilot with an eye to inform larger-scale investigation of Google Expeditions in the future.

Keywords: computer-assisted language learning; wearables; constructionism; social constructionism

1 Introduction

The onset of Virtual Reality (VR) technology can be traced to the 1960s in the entertainment industry. Since then, VR has been leveraged to meet the needs of curricula in subjects such as mechanics, art, medicine, science and language learning. Several studies indicate that these technologies provide fertile ground for visualizing abstract concepts, but also give opportunities to visit and interact with places or object that time or spatial restrictions might limit, engaging learners in authentic situations and interactive communication [1-3]. Despite the positive impact of VR, evidence also shows instructors' reluctance to engage in their use, as it requires a high level of advanced technology knowledge (e.g. in the case of Oculus VR, Google Glass and Samsung Gear; Yap [4]).

This study incorporated VR cardboard as a low-cost 3D viewer in conjunction with a smartphone in an intensive Greek language course. VR Cardboard is a low-cost technology product compared to other VR devices. On 2016, via Google Expeditions, Google has launched a number of virtual environments aiming at giving teachers and students the opportunity to visit places or environment that are not able to visit ordinar-

ily. Considering that nowadays most of the students own a smartphone, and also knowing that a VR cardboard can be purchased for less than 20 dollars, VR cardboard along with Google Expeditions is the cheapest solution in the market for creating VR environments.

Incorporating VR in the curricula of health-related professionals, such as perspective nurses, we explored their exposure to virtual environments with an eye to foster social exploration within small groups of language learners. This study confronts with the theoretical framework of social constructionism, giving students opportunities to explore a specific topic as an initial step for knowledge construction [5-7]. The uniqueness of this case study is that it explores the potential of a novel tool, such as Google Expeditions, for enhancing understanding of abstract concepts related to Nursing. The following research question guides this study:

- **How a low-cost VR kit in conjunction with Google Expeditions can facilitate social exploration within a small group of language learners?**

2 Setting

All data related to this study were collected at a public, Greek-speaking university in the Republic of Cyprus. The study took place in a Greek as a second language course, (October 2016- June 2017). The class met face-to-face every day for five hours, for a total of 650 hours. The course was particularly designed to meet the needs of university students who planned to study Nursing. The participants were three male students from Kenya aged from 19-27 years.

3 Tools and materials

Students used a virtual reality viewer and Android mobile phones in which they downloaded Google Expeditions application. Expeditions are group experiences with the instructor acting as a guide leading and the students following along (see Figure 1).

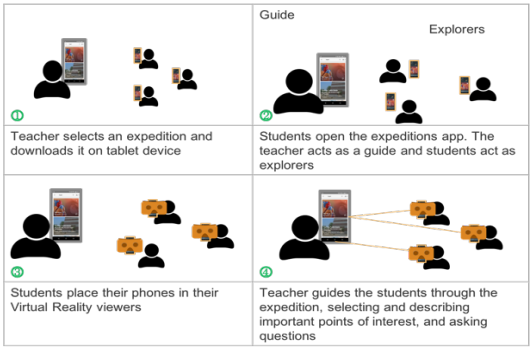

Fig. 1. Setting up Google Expeditions

The instructors controlled and guided students through Google Expeditions from an Android tablet. Google expeditions was incorporated in the existing curriculum of the course and explored both general topics (e.g. house description), as well as specific topics related to their profession (such as clinic admissions, surgical preparation etc.).

4 Methodology

Data was collected through a questionnaire, interviews, a focus group, daily field notes kept throughout the course by the instructor, instructors' and learners' reflective diary. To triangulate the findings, the study also collected data by observing students' behavior during the virtual field-trips. We analyzed the data set using the Qualitative Research Software Nvivo 11. The content of the utterances was read for meaning to define segment boundaries, thus, consecutive sentences that constructed the same meaning were taken as one text unit and coded into a single code [8]. The coding focused on the actions that took place in order for learners to socially navigate in a virtual field-trip.

5 Findings and Discussion

The study identified that a low-cost VR kit in conjunction with Google Expeditions can facilitate social exploration of authentic nursing-related contexts, providing opportunities for communication, sharing of ideas, concepts, experiences and artifacts.

5.1 Intra- and extra- VR communication

Google expeditions can facilitate intra and extra- VR communication and foster students' speaking and listening skills. Through virtual trips, a) the instructor guided students and posed questions for specific important teaching moments given within the application; and b) students listened to their instructors' guidance and describe what they could see during and after the exploration.

5.2 From abstract to tangible concepts

Virtual trips act as a common experience for instructor and students making abstract concepts and ideas tangible and vivid. As noted by one student: *I was finding it hard to describe something [that I have not seen].* (S3, Interview)

5.3 Affordable visit to authentic environments

Google expeditions provided a gateway for visiting places that students would not be able to visit and consequently practice language related to the specific context like '*being in the hospital*' (S2, focus group). Moreover, the use of virtual trips raised students' curiosity and interest for a specific topic. As noted by one student: "*by describing the pictures […] makes learning interesting and sticks in the memory*" (S3, Reflections).

5.4 Vivid exploration leading to artifact construction

Having completed their exploration, students were then tasked to construct an artifact related to the specific environment, i.e. concretize what they had experienced in a report or a presentation related to the specific virtual trip. To facilitate the completion of the task, students were instructed to switch their Expedition from explorers to guiders.

6 Conclusion and Future Work

This case study reported on how the use of a low-cost VR kit in conjunction with Google Expeditions enabled students and instructors to extend the borders of the classroom by making virtual walkthroughs in places that would normally be unreachable. Virtual field trips triggered social exploration through inter- and extra-VR communication, sharing of ideas, concepts and experiences. We suggest that development emphasis should initially be on enriching the library of Google Expeditions, involving its users in making process. Future research should focus on further implementation of the specific technology in different settings (e.g. for healthcare and HCI education). Finally, longitudinal studies should also be conducted to assess the impact of the specific tool.

7 References

1. Merchant, Z., Goetz, E. T., Cifuentes, L., Keeney-Kennicutt, W., & Davis, T. J. (2014). Effectiveness of virtual reality-based instruction on students' learning outcomes in K-12 and higher education: A meta-analysis. *Computers & Education*, *70*, 29-40.
2. Seo, J. H., Smith, B., Cook, M., Pine, M., Malone, E., Leal, S., & Suh, J. (2017, March). Anatomy builder VR: Applying a constructive learning method in the virtual reality canine skeletal system. In *Virtual Reality (VR), 2017 IEEE* (pp. 399-400). IEEE.
3. Chen, Y. L. (2016). The Effects of Virtual Reality Learning Environment on Student Cognitive and Linguistic Development. *The Asia-Pacific Education Researcher*, *25*(4), 637-646.
4. Yap. M. (2016). Google Cardboard for a K12 Social Studies Module. URI/DOI:http://hdl.handle.net/10125/40604
5. Parmaxi, A., Zaphiris, P., Michailidou, E., Papadima-Sophocleous, S., & Ioannou, A. (2013). Introducing new perspectives in the use of social technologies in learning: Social constructionism. In P. Kotzé et al. (Eds.), Proceedings of INTERACT 2013, Lecture Notes in Computer Science (Vol. 8118, pp. 554-570). Springer.
6. Parmaxi, A., & Zaphiris, P. (2015). Developing a framework for social technologies in learning via design-based research. Educational Media International, 52(1), 33-46, DOI:10.1080/09523987.2015.1005424
7. Parmaxi, A., Zaphiris, P., & Ioannou, A. (2016). Enacting artifact-based activities for social technologies in language learning using a design-based research approach. Computers in Human Behavior, 63, 556-567.
8. Chi, M. T. H. (1997). Quantifying qualitative analyses of verbal data: A practical guide. The Journal of the Learning Sciences, 6(3), pp. 271–315.