

PREFACE

Educational Location-based Interaction

1. Thematic introduction

Mobile devices have become more common in recent years. A key feature is their location awareness. The absolute location as well as the relative location awareness related to an object can be exploited for location-based applications on mobile devices allowing location-based interactions. A common example are digital scavenger hunt apps that guide users to different locations. Social inclusion [1] and social interaction [2] are a common goal of location-based experiences. Location-based apps are also used for learning purposes, as they support a variety of learning concepts. In their literature review on mobile apps in general [3], the authors found situated learning, inquiry-based learning, sociocultural theory, scaffolding, communities of practice, and seamless learning, which can be taken as an indication of the manifold didactic options of location-based apps.

Moreover, developments opening up new possibilities have been observed for more than a decade [4] are related to Internet of Things (IoT), ensuring that interaction possibilities of mobile devices with many other technical objects are provided. In addition, the Smart Cities paradigm provides more sensors and location-based data both offering options for location-based interactions potentially fostering learning. This is being enhanced through the 5G networks being implemented over the world, with more and more connected devices.

Another group of location-based interactions is given by commercial location-based entertainment games. Games such as Ingress, Pokémon GO and Minecraft Earth attract a large player base on the one hand and are increasingly credited for learning effects on the other [5,6]. However, it has also been observed that convergence between the real world and superimposed virtual layers does not necessarily exist [7]. The relevance to learning remains to be investigated.

Based on these trends, this special issue intends to foster a more general discourse on the specific contexts in which location-based interactions, e.g. enabled by location-based apps, might be at the core of learning tools, based on the debate of mobile and context-based learning. Some of the contributions in this focus section provide some guidelines on the balance between technical content and educational purpose, while the main contribution of others is more in the area of user experience and immersiveness. Among the topics of interest were design frameworks for (educational) location-based interactions and Augmented Reality (AR) technology enabling location-based interactions.

2. Summaries

Overall the work with this special issue embraced the involvement of 30 scholars in the role of authors, editors and reviewers. This project was a true global enterprise by

scholars from four continents and ten countries, including Australia, Austria, Brazil, Colombia, Cyprus, Finland, Germany, Italy, Romania, Spain, Sweden, and the US. The article by Nekoui and Roig “Children and the Mediated City. Place Attachment Development Using Augmented Reality in Urban Spaces” focused on augmented spaces as main elements of mediated cities. The authors discuss the application of Augmented Reality to facilitate communication and interaction between digital and physical spaces. The paper explored three case studies that exhibit how children use AR technology to develop various skills. The goal was to promote AR as a contemporary tool that helps children better perceive and experience the feeling of place attachment in their city.

The article “A framework for designing applications to support knowledge construction on learning ecosystems” written by Silveira, Cury and de Menezes discussed the increased digital immersion of education and the role learning ecosystems have to support informal and personal aspects of learning. The article develops a framework for location-based applications that may support the modeling of Smart Learning Environments. Cases are included to demonstrate the framework and show its practical implications.

The article "Attention, stimulus and augmented reality for urban daily life education on a social peripheral setting: the 'Altamira - story-telling streets'" by Ricca, Lupo, Diniz, Veras, and Mazzilli addresses designers of location-based experiences. The authors consider location-based experiences in the urban environment as cognitive and attentional stimuli and develop a stimulus level framework in which they distinguish between linear, circular and spiraled stimuli. The framework, which is validated in the article, aims at reflecting on contextual educational experiences.

Raber, Ferdig, Gandolfi and Clements explore foundations of AR in teaching related to psychology of learning in their article "An analysis of motivation and situational interest in a location-based augmented reality application". Interestingly, they find a decrease in motivation alongside an increase in situational interest as well as a gain in knowledge. What needs to be noted is that the subject of the AR experience, namely tragic shootings at the authors' institution just over 50 years ago may likely not be conducive to motivation. Thus, one lesson may be that assertions regarding psychology of learning must also be contextualized in terms of the knowledge being imparted.

Special thanks go to the editor, Carlo Giovanella, who gave the inspiration for this focus section and who patiently and constructively guided the editing process, and to the reviewers, without whom this focus section would not have been possible.

3. Conclusion

The multifaceted topics of the articles in this focus section highlight that location-based interactions have found their way into various learning scenarios for different age groups and teaching topics. It also illustrates the wide range of factors and the multi-disciplinarity that characterize a good location-based digital app. As digitalisation continues to spread, the technical foundations are broadening, suggesting that the possibilities and importance of location-based interaction will continue to grow in the future. We believe that the articles provide valuable insights into the current state of location-based interactions and the prospects for the future, and we are intrigued about

potential further developments. May the articles be a good inspiration for the readers' own approaches to the use of location-based interactions and researches!

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