VIAS | Viseu InterAge Stories:

developing an app to foster Social Inclusion and Healthy Lifestyles

Cristina Azevedo Gomes
Escola Superior de Educação
CI&DETS do Instituto
Politécnico de Viseu
mcagomes@esev.ipv.pt

Lia Araújo
Escola Superior de Educação
CI&DETS do Instituto
Politécnico de Viseu
liajaraujo@esev.ipv.pt

Maria Figueiredo
Escola Superior de Educação
CI&DETS do Instituto
Politécnico de Viseu
mfigueiredo@esev.ipv.pt

Nídia Morais
Escola Superior de Educação
CI&DETS do Instituto
Politécnico de Viseu
salome@esev.ipv.pt

José Pereira
Escola Superior de Educação
Instituto Politécnico de Viseu
jp@esev.ipv.pt

Pedro Rito
Escola Superior de Educação
Instituto Politécnico de Viseu
rito@esev.ipv.pt

Sónia Ferreira
Escola Superior de Educação
Instituto Politécnico de Viseu
sonia.ferreira@esev.ipv.pt

Teresa Gouveia
Escola Superior de Educação
Instituto Politécnico de Viseu
tgouveia@esev.ipv.pt

Abstract—VIAS | Viseu InterAge Stories aims to promote communication, understanding and collaboration between different generations, deepening the sense of belonging to the city and developing a share vision of their identity. Having the city of Viseu as the study case setting, the project aims to develop and evaluate a collaborative app that promotes interaction between generations and the practice of outdoors healthy lifestyle. Inhabitants will be invited to create collaboratively, while touring and interacting with and about the various places of reference, stories about their city, from the memories and reminiscences of the elderly to the meanings of the present and the expectations of children and youth concerning those same sites. We present the referential framework that supports the development of VIAS, discussing both its theoretical foundations and the methodological approach.

Keywords—intergenerational; active aging; smart city; digital inclusion

I. INTRODUCTION

This paper presents theoretical and methodological issues important to the development of the project VIAS | Viseu InterAge Stories. This project will be implement in the second semester of 2017 and in 2018 and aims to contribute to the promotion of collaborative interaction practices among different generations, deepening the sense of belonging to their city and promoting the practice of outdoor physical activities. To this endeavour the collaboration of several institutions, namely High Education Institutions, Municipalities and a software company, will be fundamental.

The ubiquity and transparency of technology provides new ways of experiencing the urban space. Using common technologies of everyday life, such as "smartphones" and "tablets" and having the city of Viseu as the exploration setting, we will start from a set of placemarks, pointing out cultural and natural heritage of the city, to challenge inhabitants to create collaboratively, while touring and interacting within the various places of reference, stories about their city, from the memories and reminiscences of the elderly, to the meanings of the present and the expectations of children and youth concerning those same sites.

These experiences are viewed as important since they facilitate intergenerational learning that might, otherwise, be diminished due to recent changes in family structures, migration, technological improvements and growing age segregation. The idea is to enrich the experience and meaning of places by exploring the lived city and adding multimedia content in layers and facets that are multi-generational marks.

II. THEORETICAL FRAMEWORK

A. Digital inclusion and Intergenerational solutions

In face of the constant technological progress and a rapidly aging society, fostering the quality of life, promoting communicative action and reducing social isolation have become relevant, particularly for the elderly who are exposed to greater vulnerability due age-related biopsychosocial changes [1,2].

Some studies demonstrate the importance of creating opportunities for communication, information and entertainment [3], in the sense that sharing technological mediated information brings certain benefits to older adults, including a general enhancement of their mental status; a strengthening of their self-concept, self-esteem and self-realization [4] and an increase in their quality of life [5]. Other research has found a decrease in feelings of loneliness [6]; a reduction in stress perception and an increase in

the level of social support [7]; and an increase in feelings of connectedness [8]. A positive link to health has also been found [9,10].

Specifically, investing in studies that involved ICTs and seniors or intergenerational relations revels positive results.

The SEDUCE project developed a community, http://www.mione.pt/, that includes a communication area with email and an instant messaging service; healthcare area; news; entertainment; and a blog. The involvement with ICTs produced positive effects on older adults, namely on social behaviour, self-perception of physical and environment facets of quality of life [4]. Technology is a privileged way to bring youth and elderly together [11] and info-inclusion is a powerful strategy to accomplish the pillars of active aging, health, security, education and participation [12]. A significant contribution to the quality of life in advanced age is participation in community activities, which help the elderly to feel useful and recognized [13]. Intergenerational activities enhance solidarity and social cohesion for young and old by creating space and time for sharing and transforming culture and cultural experiences [14]. Intergenerational reminiscence, sharing autobiographical memories between generations, is not only potentially beneficial to older people´s psychosocial wellbeing, but it also a way to transmit the heritage of folk traditions, triggering the interest of younger generations about their roots [15]. These experiences are viewed as important since they facilitate learning that might otherwise be diminished due to the less intergenerational contact, related with changing family structures, migration, technological changes and growing age segregation [16]. These exchanges can, specifically, enrich the experience and meaning of places, adding layers and facets that are multi-generational to the lived cities.

Although digital technologies are accused of excluding and dividing generations and individuals, being referred as one of the main causes of the huge gap between youth and elderly culture [11], technology can also be the solution to bring generations together.

The combination of digital technologies and reminiscences, i.e. the act or process of recalling past experiences and events, can be a meeting point for different generations, where they can share, re-elaborate, and read memories and meanings [17]. Technology can also support reminiscing activity by eliciting memories, supporting the creation of representations or the collection of artifacts and sharing them with others, in multimedia, geo-referenced ways. Having intergenerational activities connected to the city and to heritage is also associated with benefits and challenges of synergistic efforts to create livable cities for all ages [18].

B. Smart cities and social inclusion

Smart cities are an emerging and expanding market [19], whose economic potential may benefit cities, citizens and small and medium-sized enterprises. According to Hollands [20], it is common to attribute responsibility for the Smart Cities' existence to ICTs. However, while ICTs are seen as facilitators of their implementation and development, they are not the only actor. It is essential that there is a willingness to develop on the part of organizations, governments, communities and society [20].

The ubiquity and transparency of new technologies provides new ways of experiencing the urban space. These technologies support the development of smart cities, and sensor networks and ubiquitous computing technologies can ensure a better management of infrastructures and utilities. However, cities become smarter when they take full advantage of its human potential creating new dynamics of wealth and social inclusion [21].

C. Viseu as a smart city

Viseu is an ancient city of undeniable importance, with testimonies from different ages and types. It has testimonials from Imperial Era to Contemporary Era, with great expression of the Modern Era [22]. With an extremely rich history, Viseu also has a very important natural heritage. Its most relevant example is the Fontelo Forest, an ex-libris of the city [23]. These testimonies make up the historic centre of Viseu as a single and unique space to explore.

Today's children and families often have limited opportunities to enjoy outdoors activities and to connect with the natural environment. However, the practice of regular physical activity is priority to ensure benefits in biological, psychological and social human factors. HEPA (European Network for the Promotion of Health Enhancing Physical Activity) as well as the Directorate General of health highlights in their strategic documents [24] the importance of promoting physical activity in countries of the European region. Ubiquitous technology allows the discussion of the use of digital tools in outdoor learning activities. In Schoolsenses@internet and DãoPetiz academy projects children used mobile technology to explore and sense Viseu's environment. They used mobile phones with GPS to create and publish, in a collaborative platform that integrates Google Earth, multisensory georeferenced messages about their schoolyards [25]. Children used computers, electronic sensors, action cameras and audio recorders to explore in situ the environment and the vinyeard activities [26]. Through outdoors activities with ICT Children developed a better connection to their environment and a deeper understanding of urban and rural life [27].

VIAS aims to take advantage of mobile technology to create an application where citizens can rediscover their city, trough healthy and intergenerational practices. It is through human activities that urban spaces become "places". How people experience and conceptualize "place" is formed by the scope and range of what happens in that space and those that inhabit it [28]. Viseu citizens of all ages will be challenge to create collaborative intergenerational stories regarding their city. The application will present georeferenced historical information about cultural and natural heritage in strategic placemarks. Younger and elder will have the opportunity to walk from place to place making their own stories, uploading new content to the placemarks.

One of the ideas that stands out and consolidates the collaborative spirit of the project is related to the characteristics and experiences of the city itself in its effort to promote and

ensure quality of life to its citizens. The project has the intention to explore and experience the city of Viseu as a memory space revitalized by the inhabitants. To this end, the urban spaces will be properly harnessed, as far as planning and humanization of public space are concerned, through the construction of identity paths of the city, which can be expanded by the participants through a collaborative and participatory philosophy.

III. VIAS'S METHODOLOGICAL APROACH

The VIAS project gives priority to an Intergenerational database to the development of a prototype for mobile devices that allows the collaborative creation of walking routes based on georeferenced points of interest.

The main goals of the project are:

- To promote intergenerational storytelling and encourage citizens to participate, collaborate and trust.
- To promote social inclusion, outdoor activity and healthy living habits.
- To develop a participatory case study, with several workshops and focus groups, to develop the conceptual model for the collaborative application.
- To design, develop and evaluate an application to support the creation, through mobile technology, of collaborative stories about urban locals.
- To evaluate the use of the application through the assessment of the intergenerational collaboration stories created and the administration of scales of well-being, self-esteem, social integration and healthy activities.

One of the main issues of the project is to integrate through the collaborative app the diverse expectations and skills of the elders and the youngers.

In the project configuration is expected the participation of a group of people representative of the target audience to which the application is intended, considering their generational, cultural, gender and technological skills.

The diversity and multiple intervention layers of the application requires methods that can capture the uptake and effects of social inclusion. It will be important to understand why and how the application works across distinctive populations. Mixed methods design, like those proposed to investigate the success of Pokémon Go [29] are suited to understand the complex web of interactions when using this kind of application.

The project will follow a participatory design methodology [30], involving ethnographic and action research studies, including workshops with local participants of different generations, focusing the exploration of intergenerational activities based on the mapping of the points of interest with book value and based on the associated physical activity. It is also necessary to evaluate physical exertion levels in the various participating age groups, which will allow, for each different georeferenced points of interest, the identification of physical activities and its impact.

Participants' mobilization will be held from a diversity of real contexts, taking advantage of the particularity of some Viseu institutions that join, in the same building, eldercare services and a kindergarten, although there are few or none practices of communication and interaction between the older and the children.

Results of these workshops will report the conceptual model of the application. The prototype will be tested with residents of Viseu to validate the concept model. Pre and post-testing will be used to evaluate the use of the application.

Technologies such as smartphones and tablets are common objects in most countries, and their use is an advantage for smart systems [31]. These devices have multimedia tools, built-in sensors and multiple forms of connectivity being potential mediator interfaces between users and context.

The project will consider the following steps:

• Mapping cultural and natural heritage of the centre of Viseu

to promote the identification of natural cultural and historical places to create a set of previous information about sights of the city to be integrated in the app as a georeferenced map to be explored and (re)written. The habitants will be invited to create and share stories about their city, based on this mapping.

• Motor and physical activity impacts

to identify the potential impacts of physical activity related to the exploration of places and city paths. Experimental observation process, monitoring and subsequent evaluation of physical exertion levels in the various participating age groups, will allow, for each different georeferenced point, the identification of physical activities and its impact.

• Design and test intergenerational activities

to join different generations together in a participatory design process in order to explore and evaluate the mobile application requirements. Involving different generations in the process of participatory design will support intergenerational test-content for the application and define task analyses and users' experience for creation and/or upload content.

• Design, implementation and evaluation of the collaborative application

to design and prototype the interactive structure, interface and content of the application. The prototype will use a developer-friendly and open-source solution based on a client server architecture that integrates a Google Maps API. Usability tests will be performed in a participatory approach within the intergenerational activities.

• Assessment of impact of the use of the application

to perform evaluation and usability tests of the application to verify if it meets the requirements that were initially established. Perform evaluation and usability tests of the application to verify if the application meets the requirements that were initially established. We also evaluate application use related issues through data collection (usability, accessibility, user experience, etc.). In this sense, it is expected to the Administration of scales of well-being, self-esteem and social integration.

IV. Conclusions and Expected Outcomes

We presented a referential framework for the project VIAS that will be implement in the second semester of 2017 and in 2018. We expect to develop a collaborative mobile application to promote collaborative interaction practices among different generations, deepening the sense of belonging to their city and the liking for the practice of outdoor physical activities. These app aims to promote social inclusion, outdoor activity and healthy living habits in the younger and the older people. Having intergenerational activities connected to the city and to cultural and natural heritage contributes to create livable cities for all ages, where spaces become places through people interactions and experiences, sharing a vision of their identity.

Exploring and using the collaborative application will promote Viseu as a smarter city, taking full advantage of its cultural and natural heritage and of its human potential creating new dynamics of wealth and social inclusion.

We also think that it is possible to use the project VIAS as a proof of concept to replicate in other contexts and cities.

References

[1] V. L. Bengtson, D. Gans, N. Putney, and M. Silverstein, "Handbook of Theories of Aging", 2 ed., New York: Springer Publishing Company, LLC, 2009.

[2] U. Pfeil, P. Zaphiris, P., and Wilson, S. "Online social support for older people: characteristics and dynamics of social support," Workshop Enhancing interaction spaces by social media for the elderly. Vienna, 2009, Available: http://www.uni-siegen.de/locatingmedia/workshops/ecscwageingworkshop/pfeil_workshop_paper_09_06_18_5_.pdf.

[3] S. Ferreira, A. Torres, Ó. Mealha, and A. Veloso, "Training effects on older people in Information and Communication Technologies considering psychosocial variables", Educational Gerontology, 2014.

[4] S. Whitbourne and J. Sneed, "The paradox of well-being, identity processes, and stereotype threat: Ageism and its potential relationships to the self in later life", in Ageism: Stereotyping and prejudice against older persons, T. Nelson, Ed. Cambridge: MIT Press, 2002.

[5] R. Zheng, R. Hill, and M. Gardner, "Engaging Older Adults with Modern Technology: Internet Use and Information Access Needs", Harrisburg, PA/US: Idea Group Global, 2012.

[6] H. White, E. Mcconnel, E. Clipp, L. Branch, R. Sloane, C. Piepper, ... T. Box, "A randomized controlled trial of the psychosocial impact of providing internet training and access to older adults", Aging and Mental Health, vol. 6, 2002, pp. 213-221.

[7] N. Bradley, & W. Poppen, "Assistive technology, computers, and Internet may decrease sense of isolation for homebound elderly and disabled persons", Technology and Disability, vol. 15, 2003, pp. 19–25.

[8] S. Gatto and S. Tak, "Computer, Internet, and e-mail use among older adults: benefits and barriers", Educational Gerontology, vol. 34, 2008, pp. 800-811.

[9] N. Choi, "Relationship between health service use and health information technology use among older adults: analysis of the US National Health Interview Survey", Journal of Medical Internet Research, vol. 13, 2011.

[10] J. Werner, M. Carlson, M. Jordan-Marsh, and F. Clark, "Predictors of computer use in community-dwelling, ethnically diverse older adults", Human Factors. vol. 53, 2011, pp. 431-447.

[11] E. Khoo, A. Cheok, T. Nguyen, and Z. Pan, "Age invaders: social and physical inter-generational mixed reality family entertainment" Virtual Reality, 12, 2008, pp. 3-16.

[12] World Health Organization, "Active ageing: A policy framework", Geneva: WHO, 2002. Available: http://apps.who.int/iris/bitstream/10665/67215/1/WHO_NMH_NPH_02.8.pdf

[13] L. Araújo and S. Melo, "Relacione-se com os outros", in O. Ribeiro and C. Paúl (Ed.), Manual de Envelhecimento Ativo, Lisboa: Lidel, 2011, pp. 141-170.

[14] G. Cortellesi and M. Kernan, "Together Old and Young: How Informal Contact between Young Children and Older People Can Lead to Intergenerational Solidarity", Studia Paedagogica, 21(2), 2016, pp. 101-116.

[15] A. Gaggioli, L. Morganti, S. Bonfiglio, C. Scaratti, P. Cipresso, S. Serino, and G. Riva, "Intergenerational group reminiscence: a potentially effective intervention to enhance elderly psychosocial wellbeing and to improve children perception of aging", Educational Gerontology, 40, 2014, pp. 486-498.

[16] The TOY Project Consortium, "Intergenerational Learning Involving Young Children and Older People", Leiden: The TOY Project, 2013. Available: http://www.toyproject.net/wp-content/uploads/2016/01/Summary-English.pdf

[17] L. Morganti, C. Scaratti, P. Cipresso, A. Gaggioli, S. Bonfiglio, and G. Riva, "How can technology help intergenerational reminiscence? A pilot study", International Journal of Web Based Communities, 12(1), 2016, p. 35.

[18] W., van Vliet, "Intergenerational Cities: A Framework for Policies and Programs", Journal of Intergenerational Relationships, 9(4), 2011, pp. 348- 365.

[19] J. Hernández-Muñoz, J. Vercher, L. Muñoz, J. Galache, M. Presser, L. Hernández Gómez., and J. Pettersson, "Smart Cities at the Forefront of the Future Internet. Future Internet Assembly LNCS", Vol. 6656, 2011.

[20] R. Hollands, "Will the real smart city please stand up? City", Vol. 12, 2008, pp. 303–320.

[21] A. Oliveira and M. Campolargo, "From Smart Cities to Human Smart Cities", 48th Hawaii International Conference on System Sciences, 2015, doi 10.1109/HICSS.2015.281.

[22] D. Rodrigues, "A cidade e a catedral (séculos XVI e XVII)", in J. P. Paiva, (coord.), História da diocese de Viseu. Viseu: Diocese de Viseu; Imprensa da Universidade, vol. II, 2016, pp. 79-112.

[23] L. Nunes, T. Pinto, R. Baptista, I. Cardoso, H. Matos, S. Lopes, C. Costa, "Guia de identificação das espécies vegetais do Fontelo", Viseu: Escola Superior Agrária, 2009.

[24] World Health Organization, "National approaches to the promotion of health-enhancing physical activity (HEPA): experiences and lessons learned from national appraisals: report of WHO workshop", Zurich, Switzerland, 20-21 June 2012. Copenhagen: Health-enhancing physical activity Network, Regional Office for Europe, World Health Organization, 2013.

[25] M. J. Silva, C. A. Gomes, B. Pestana, J. C. Lopes, M. J. Marcelino, C. Gouveia, A. Fonseca, "Adding Space and Senses to Mobile World Exploration", in A. Druin, Mobile Technology for Children. Boston: Morgan Kaufmann, 2009, pp. 147-170.

[26] C. A. Gomes, A. Novais, I. Abrantes, "Exploring the Vineyard Cycle: mobile technology in non-formal environmental education settings", International Symposium on Computers in Education (SIIE), Salamanca, 2016.

[27] M. P. Figueiredo, C. A. Gomes, and N. A. F. Gonçalves, "Going outside: discussing the connection between pedagogical practices with digital tools and outdoor learning in early childhood and primary education", in L. Gómez Chova, A. López Martinez, and I. Candel Torres (Eds.), EDULEARN16 Proceedings Barcelona: IATED, 2016, pp. 3058- 3066.

[28] N. Wouters, S. Claes, V. Moere, "Investigating the Role of Situated Public Displays and Hyperlocal Content on Place-Making", Interaction Design and Architecture(s) Journal IxD&A, Vol.25, 2015, pp. 60-72.

[29] A. Clark and M. Clark, "Pokemon Go and Research: Qualitative, Mixed Methods Research, and the Supercomplexity of Interventions", International Journal of Qualitative Methods. January-December, 2016, pp. 1-3.

[30] M. J. Muller and A. Druin, "Participatory Design: The third space in HCI", in J. Jacko (Ed.) The Human Computer Interaction Handbook, 3rd Edition New York, NY: Taylor & Francis, 2011, pp: 273-291.

[31] S. Lau and K. David, "Movement recognition using the accelerometer in smartphones", Future Network and Mobile Summit , 2010. Available: http://ieeexplore.ieee.org/abstract/document/5722356/http://ieeexplore.ieee.org/abstract/document/5722356, 2010.