Raising awareness and promoting informal learning on World Heritage in Southern Africa: The case of WHACY, a gamified ICT-enhanced tool

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ABSTRACT

Diffusion of digital games and the trend of gamification in various fields have increased scholars' attention on how digital games or their elements can be introduced into formal and informal learning practices. Majority of the research in this field has been conducted in economically developed regions and not so much in emerging economies. With this study the researchers focused on developing region of Southern African Development Community (SADC). *World Heritage Awareness Campaign for Youth (WHACY) in SADC* is a campaign dedicated to raise awareness and foster informal learning among Southern African youth about the heritage and sustainable tourism in the region. The campaign employed an online and offline gamified learning platform, which was supported by a dedicated website, Facebook page, wiki and offline materials. In one year of operation the campaign reached more than 100K audience. The purpose of this paper is to present the development, implementation, and evaluation of the campaign. The goals of the evaluation were dedicated to assess user experience in terms of engagement and conduciveness to learning as well as exploring the possibility of a gamified application to be integrated into the regular high school tourism curriculum. South African tourism students' and tourism teachers' perspectives were taken into consideration.

Keywords: awareness campaign, SADC, South Africa, gamification, formal and informal learning, world heritage sites

INTRODUCTION

Computers, internet and mobile technology have opened up the way to digital games, which have evolved into a significant global business and have become a common phenomenon in contemporary culture (ESA, 2015). However, beyond their use as entertainment, game mechanics and game thinking have also been applied in different industries for different purposes: this trend is called gamification (Deterding, 2012). Indeed, the idea of introducing game elements in non-entertainment environments is not novel; it has its roots in marketing activities such as reward systems, points collection, loyalty or frequent flyer programs (Seaborn & Fels, 2015; McGonigal, 2011). Game elements are also found in various simulations in the fields of education and training (Zichermann & Cunningham, 2011). The current re-emergence of gamification is influenced by factors such as cheaper and more accessible technologies, personal data tracking, and the popularity of games in individuals' everyday lives (Deterding, 2012).

Numerous positive claims have been put forward regarding the aspect of gamified learning in education, such as increased motivation and engagement, empowerment of students with low self-efficacy and even reinforcement of critical thinking (Turkay et. al., 2014; da Rocha Seixas et al., 2016). While the research related to gamification and education in developed countries (North America and Europe) are pervasive in the literature (Boyle et al., 2016; Dicheva et al., 2015), only a few studies have been conducted in the developing countries environment (da Rocha Seixas et al., 2016; O'Donovan et al., 2013).

Within this paper a campaign called *World Heritage Awareness Campaign for Youth (WHACY) in SADC,* which is dedicated to raise awareness and foster informal learning among Southern African youth about the heritage and sustainable tourism in the region, is presented. The campaign employed an online and offline gamified learning tool, which was supported by a dedicated website, Facebook page, wiki and offline materials. In one year of operation the campaign reached more than 100K audience. The purpose of this paper is to present the development, implementation, and evaluation of the campaign. The goals of the evaluation were dedicated to assess user experience in terms of engagement and conduciveness to learning as well as exploring the possibility of a gamified applications to be integrated into the regular high school tourism curriculum focusing on one of the SADC countries: South Africa.

LITERATURE REVIEW

Games and learning

Playing and learning is not a new phenomenon; the belief that children learn while playing is well recognized. While playing, children practice skills and develop social attitudes that are central to their social, motoric, emotional and intellectual development (Sutton-Smith, 2001). However, the recent arrival and growing acceptance of digital games has generated new interest on how to harness and take advantage of them for educational goals (Gee, 2008; Prensky, 2005). The relationship between games and learning has been approached from various theoretical perspectives: examining the informal learning that occurs during play (Sefton-Green, 2003) or the exploring the incorporation of games in formal learning activities (De Freitas & Oliver, 2006). Games, simulations, and gamification bridge the distinction between formal and informal learning. Introducing something that is considered an informal activity (gaming) into formal learning settings provides opportunities for better understanding on how formal and informal learning could reinforce each other in order to support cognitive development and promote learning (Sefton-Green, 2003; Koutromanos & Avraamidou, 2014).

In their systematic review of 143 papers of high quality evidence about outcomes of the games in education, Boyle et al. (2016, p. 182) reported that the most "occurring outcome was knowledge acquisition "2followed by perceptual and cognitive, affective and behaviour change, with fewer papers reporting physiological, skills and soft and social skills outcomes". Furthermore, STEM subjects (science, technology, engineering and mathematics) as well as health were the most popular domains for educational digital games. Boyle et al. (2016) report that research on games in education has an international dimension: out of 143 evaluated studies, 62 were conducted in North America, Europe (n=45), Asia (n=26), South America (n=5) and Australasia (n=5). Interestingly, not even one study in the systematic review was conducted in Africa. This also corresponds to similar findings of Hew et al. (2016) who reported that gamification studies are mainly produced in the USA and Europe.

Theoretical background

Engagement and motivation are usually the ultimate goals of gamification practices. Thus, it is importance to uncover what makes games and gamification engaging to its users and which theories support these practices specifically for learning. It is critical to understand intrinsic (driven from within the user, mainly for the enjoyment the activity provides) and extrinsic (driven from external factors, such as prize, higher grade, praise from the teacher etc.) motivations of the learner while engaged with gamified experiences (Kapp, 2012; Deci & Ryan, 2002). Majority of the theoretical frameworks of motivation include both types of motivations. Three theories are discussed below, which have informed the design and development of the presented case study.

Self-Determination Theory is often used to explain human motivations to perform an activity or task. According to Deci and Ryan (2002), three psychological innate needs motivate individuals to initiate behaviour: (i) *Competence,* the need of a human being to be challenged and to attain 'mastery' through acquiring new skills; (ii) *Autonomy,* the feeling that a person has control and determines the outcomes of her/his actions; and (iii) *Psychological relatedness*, the individual needs to interact and connect with others.

Furthermore, Malone (1981) introduced the *Theory of Intrinsically Motivating Instruction.* He investigated what makes games fun and intrinsically motivating and identified three principal elements: (i) *Challenge,* which depends on the uncertainty of the outcomes. If the user knows the exact outcome of using the application or knows that s/he will not be able to reach the goal, this will not facilitate challenging environment. In order to make the outcomes uncertain variables such as hidden information, various difficulty levels, or randomness could be introduced. (ii) *Fantasy.* It is an environment that evokes vivid mental images of things related to learning materials (using metaphors, for example), which has capacity to make instructional applications more engaging and provides emotional and cognitive advantages. (iii) *Curiosity.* The gaming environment should provide optimal informational complexity, which would evoke users' cognitive and/or sensory curiosity throughout the process.

Finally, *Flow Theory* significantly informs gamification design. Flow is a mental state of full immersion with complete focus on the task (e.g., playing a video game) (Csikszentmihalyi, 1990). Flow concerns full mental involvement with an activity with continuous engagement during the process: the perfect state between anxiety and boredom. Flow also concerns the balanced state between players' abilities and skills compared to the challenge level of the tasks. According to Csikszentmihalyi (1990), eight components enable a state of flow: (i) *Achievable task*; (ii) *Concentration*; (iii) *Clear goals*; (iv) *Feedback*; (v) *Effortless involvement*; (vi) *Control over actions*; (vii) *Loss of self-consciousness*; (viii) *Loss of sense of time*.

Based on the above mentioned theories, various authors (Kapp, 2012, Nah et al, 2014; Lee & Hammer, 2011) identified and listed the most common gamification elements used in the education:

- *Rewards.* This concept describes the feedback and/or incentive arrangement within the gamified application that encourages users to continue and can support a high level of motivation. Even negative rewards, which could be considered as punishment within the game, can facilitate learning. As argued by Kapp (2012), it is better to provide the user with smaller multiple rewards, distributed throughout the game instead of one big prize. Thus, *points and badges* are common gamification features, and serve as a form of rewards while progressing through the game and measuring gradual achievements and success.

- *Challenge* is the extent to which user skills match the challenges presented by the digital game (Kiili, 2005; Csikszentmihalyi, 1990). Appropriate challenges will keep the player engaged and motivated throughout the game and the playfulness of the experience will be higher (Woszczynski et al., 2002). Thus, if the application is too challenging the user may become frustrated quickly. On the contrary, if the application is not challenging enough the user may become disinterested. Elements of challenge within games are often supported by different difficulty *levels.*

- *Feedback* is a typical game feature, which is usually instant, clear and direct. Based on feedback, players can make certain decisions, that is, change or correct their playing behaviour. Educational gamification researchers argue that the immediacy and frequency of feedback contributes to greater learner engagement, effectiveness and attainment of the flow state (Kapp, 2012; Csikszentmihalyi, 1990).

• *Competition* among players is a common game element, where each participant strives to optimise their performance and to attain the best possible achievement against the other participants. The competition is often intensified with another gamification feature: *leader boards*. The leader board is a social component embedded into the digital game, consisting of a list of players with top scores. According to game designers, leader boards can be powerful motivators for players, pushing them to play repeatedly in order to get to the top of the list.

CONTEXT

The applied domain: UNESCO World Heritage Sites & tourism

In 1972, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) adopted a *Convention Concerning the Protection of the World Cultural and Natural Heritage*, aimed at the "identification, protection, conservation, presentation and transmission to future generations" (UNESCO, 1972: p. 3) of the world's cultural and natural heritage of outstanding universal value. As of May 2016, the World Heritage Committee has included 1031 properties in the World Heritage List: 802 cultural, 197 natural, and 32 mixed sites in 163 countries. The World Heritage Convention clearly states that apart from conservation and protection of world heritage, its "presentation" (UNESCO, 1972: p. 3) is also among its primary aims. Presentation implies communication and creation of public awareness among the local community (ibid.) and international visitors (Pedersen, 2002). According to Weaver (2012), sincere public awareness and appreciation is required to generate sustainable conduct. Furthermore, the great potential of ICTs is recognized to facilitate sustainable tourism through awareness raising, valorisation, sensitization, and guidance for locals and tourists (Ali & Frew, 2013; Schieder et al, 2014). Indeed, the Convention states the need for "educational and information programmes to strengthen appreciation and respect" (UNESCO, 1972: p. 13) for cultural and natural heritage sites. One of the potential strategies to contribute to this reconciliation of tourism and preservation of heritage places is harnessing technologies for learning purposes (Cantoni et al, 2009) and possibly introducing gamification features for more profound engagement and interest creation.

The geographical context of the presented campaign is Southern African Development Community (SADC), a strategically important region in economic and geographic terms located in Southern Africa. It includes 15 countries: Angola, Botswana, Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe. SADC region is considered still a developing geography, undergoing various sustainable development challenges. The SADC region is very rich in touristic resources in term of cultural and natural properties, which every year are attracting increasing numbers of tourists. According to the World Travel and Tourism Council (WTTC) and the Regional Organization of Tourism in Southern Africa (RETOSA), tourist international arrivals grew from 13 million to approximately 23 million during 2002-2012. These numbers are positively influencing the GDP, employment, and investment in the region. Therefore, tourism development in SADC is viewed as a substantial tool to contribute to the economic growth, hence, to alleviate poverty, advance security, and empower the promotion of local attractions (WTTC, 2013). The 15 countries of SADC region host 39 World Heritage Sites (WHSs) – 17 cultural, 19 natural, 3 mixed – properties of outstanding universal value representing the cultural and natural richness of the region, which at the same time attract very high interest from the tourism perspective.

PROJECT: WHACY

Case study: Awareness campaign about UNESCO World Heritage Sites in SADC

UNESCO Chair in ICT to develop and promote sustainable tourism in World Heritage Sites based at USI – Università della Svizzera italiana in Lugano (Switzerland) together with *Hospitality Youth Initiative (HYI),* a South African NGO and the *Regional Tourism Organisation of Southern Africa (RETOSA)* have designed an awareness campaign about the 39 WHSs in the SADC region.

The concept of the campaign was built on three main pillars:

• *Awareness.* Firstly, the gamified online/offline quiz tool, supported by online outlets as a dedicated website, wiki, and Facebook page, were designed to spread awareness among local students and young adults in Southern Africa around the unique and universally valuable heritage in their region.

• *Informal learning*. Participants become aware and gain knowledge about the outstanding value of the heritage in their region, and about the importance of sustainable tourism to ensure development at those sites.

• *Empowerment.* The promotion of a sense of ownership among youth of such heritage. The youth becomes aware of heritage as a relevant asset for their professional future, as well as for local development.

The project addressed the following audiences:

• Schools in the SADC region were invited to participate in the project, but the actual game was played by individual students with a foreseen age from 16 to 19.

• Any other individual participant interested in the topic.

Campaign's development: ICT tools

The principal tool for the campaign is an online/offline quiz platform. The platform is based on an algorithm that randomly retrieves questions from a previously populated database, and presents to the user a unique collection of multiple choice quizzes. An ad hoc database of 470 questions has been created, distributed among four categories:

• 390 questions on 39 World Heritage Sites (10 for each site divided into 5 difficult and 5 easy ones)
• 40 questions about sustainable tourism development
• 20 questions about UNESCO
• 20 questions about eTourism (information and communication technologies and tourism)

The goal for the user is to collect the highest score by correctly answering the questions. By reaching the end, the user obtains a personalized certificate with her/his final score in printable PDF format (Figure 1).

In order to adapt the contents to audience, who was either second, or third English language users, all the questions were revised by a panel of experts gathered by South African project partner. Moreover, during the design and development phase the quiz was hosted on a Swiss server. Before the launch, the application was migrated to a South African server in order to allow faster connection and data transmission for game participants. Additionally, an offline version on a CD-ROM was developed.

Figure 1: Awareness campaign interface example and final certificate

Gamification features of WHACY

Firstly, *rules* are provided in a dedicated section of the platform, specifying all the information needed about how to proceed with the game. The *reward structure* of WHACY consisted of a point system: the user collected points after answering questions. At the end of the quiz, a certificate was available to download, indicating participation and the score achieved. All these can be considered as extrinsic motivators for players to answer the questions correctly. *Feedback* is another gamification element present in the WHACY platform. Every time a player submits an answer, s/he receives an immediate feedback if the answer was correct, partially correct or incorrect. Moreover, a player receives complimentary information related to a question to facilitate learning about the topic. In addition, a progress bar is displayed to players to indicate the remaining questions to finish the game. As for *aesthetics,* the presence of different pictures in every question (corresponding to the WHSs described in the questions) and the presence of some videos enhance the user experience. Regarding the element of *time*, it is important to mention that during the first round of the quiz, the players were not restricted by time, and there was no time element present. Nevertheless, in the second round, a restriction of 30 seconds to answer a question make the game more intense by pressuring players to provide the answer within a limited period. The *replay* option is offered at the end of the game allowing the players to improve on their performance and increase their knowledge regarding the topics covered.

The game was organized along two main phases:

- *First Phase (May – Aug. 2014)*. The first round contained 28 questions: 16 questions on four selected WHSs out of 39, four questions about UNESCO, four about sustainable tourism development, and four about eTourism. Questions were randomly selected from the pool of available questions, which meant that different playing instances were possible, without being exposed to the same questions. Participants could also play offline (CD-ROM).

• *Second Phase (Sep. – Nov. 2014).* This round contained 42 questions about all 39 WHSs and other topics without a possibility to preselect WHSs as in the first round. Each question had timer with 30 seconds. The offline tool did not support the second round.

The initial plan of the campaign also envisioned the third phase: a residential workshop together with top performing students from each SADC country, however, due to various challenges it was cancelled.

Table 1 summarizes other ICT platforms used for the reinforcement of the campaign.

Table 1: Campaign's supporting ICT platforms

Platform	Description
Dedicated website: www.whacy.org	The website was created using Worpress content management system with the main goal of presenting the project, its partners and goal to the wide public.
Dedicated wiki: http://wiki.africaheritagetourism.org	Wiki was created as content support repository about all WHSs and other topics: UNESCO, sustainable tourism development, eTourism. The wiki platform was chosen because it enables an easy management in terms of content creation and editing without any HTML or other coding perquisite.
Facebook page: www.facebook.com/africaheritagetourism	Facebook page has been created in order to support the project's promotion. It reached more than 4K likes (May 2016) mainly from Madagascar, Lesotho, Mozambique, Tanzania, Mauritius, Zambia, Malawi, Democratic Republic of Congo, South Africa and Botswana.

Campaign's outreach

Promotion of WHACY has been done both offline and online. Activities have been aimed at recruiting participants, as well as informing relevant stakeholders. Online promotion was mainly supported by dedicated Facebook page (see above) through regular posting about WHSs in SADC, photo competition, as well as several paid campaigns. Moreover, digital promotional materials where spread through channels such as YouTube. Furthermore, an email campaign was carried out approaching 6'900 potentially interested schools in SADC, however, only 18% had working email addresses. To overcome Internet connection problems, the offline version (CD-ROM) of WHACY has been produced and shipped to almost 2'500 schools in SADC region. Moreover, 68 schools have been visited in person presenting the campaign to the head of the school and the relevant teacher (Tourism, Geography and/or IT).

Mainly due to a lack of internet connectivity the participating schools preferred to use offline version in CD-ROM format. More than 104'000 students have been exposed to online and offline WHACY as of March 2015. The offline exposure was estimated by HYI, based on telephone interviews with a sample of 128 schools, who received offline material. Participants from 13 SADC countries have been exposed to the campaign, but no participation from Swaziland and Angola has been reported.

CAMPAIGN'S EVALUATION METHODOLOGY

For the evaluation part of the campaign, one country from SADC region was selected i.e. South Africa, which is a developing/emerging country with a growing tourism industry. Tourism in South Africa is recognised as a key economic sector with potential for continuous growth, which demands a skilled and professional workforce. This implies that the local workforce should be aware of the nature and role of tourism, and should be able to critically evaluate its potential. Since 2000 tourism as a subject has been widely introduced at secondary school level (10-12 grades) throughout South Africa. Tourism subject has seen significant growth in terms of the number of schools where it is taught: from 120 schools in 2000 to almost 3'000 schools in 2014 (Umalusi, 2014). To this date, tourism is one of the most popular electives in high schools: up to 20% of all high school students select the subject (Allais, 2014).

Tourism education in South Africa is constrained by a lack of trained teachers, students' limited exposure to tourism industry, and students' lack of interest and motivation to study the subject (Adukaite et al., 2016; Umalusi, 2014; Chili, 2013). Tourism subject in South African high schools has a reputation of being an *"easy"* subject, which in some ways becomes a *"dumping ground"* for academically weak students or those who try but eventually cannot cope with other subjects (ibid.). The introduction and adoption of ICT has been identified as a potential enabler of tourism education (Adukaite et al., 2016). To address the challenge of students' apathy regarding the subject, one potential strategy would be the use of digitally gamified learning.

Due to the fact that topics of World Heritage Sites and sustainable tourism are covered in the South African tourism curriculum, audience of tourism teachers and students have been chosen for the evaluation of the campaign.

The evaluation of the campaign was carried out employing mixed methods throughout two phases (Table 2). The goals of the evaluation were mainly dedicated to assess students' user experience in terms of engagement and conduciveness to learning as well as exploring the possibility of a gamified application to be integrated into the regular high school tourism curriculum.

Table 2. Overview of the campaign's evaluation

Phase	Evaluation Method	Location	Number of subjects
Phase 1	Focus groups	South Africa	9 focus groups with high school students from 11-12 grades taking tourism subject
	Semi structured interviews	South Africa	19 high school tourism teachers
Phase 2	Questionnaire	South Africa	209 high school tourism teachers

Phase 1: Fieldwork in South Africa

During three months (April-June 2015) the main researcher has visited 16 schools in two provinces of South Africa: Western Cape Metro North District (ten schools) and Eastern Cape Western District (six schools). Firstly, the lists with the high schools offering tourism subject were obtained from the Department of Basic Education and the sample for the study was drawn including different types of schools in regards to their socio-economic characteristics because

tourism is taught in all schools – from well-resourced private to poorly resourced disadvantaged community schools.

A typical visit to the school consisted of a group of tourism students (grades 11-12) playing WHACY for 30-45 minutes in the school's computer lab. Afterwards available and interested students were invited for a focus-group discussion, 20-45 minutes. For focus groups' discussion, semi-structured questioning approach was used to ensure consistency among groups, however, allowing quite large degree of flexibility. Finally, semi-structured interviews were conducted with tourism teachers lasting 30-75 minutes. The focus group and interview protocols covered different questions related to ICT integration for tourism teaching, however, in this paper only findings related to the campaign are reported. Table 3 provides an overview of the fieldwork, number of students and teachers involved.

Table 3: Outline of the field work

Type of school	Western Cape (WC)	Eastern Cape (EC)
Public school (township). Previously, before 1994, only black or coloured schools, often inadequately resourced.	5 schools 60 students played 3 focus gr. (25 students) 6 teachers	4 schools 73 students played 2 focus gr. (19 students) 5 teachers
Public school (ex-model C). Previously, before 1994, only white schools, well resourced, now integrated.	3 schools 38 students played 2 focus gr. (16 students) 4 teachers	2 schools 15 students played 1 focus gr. (8 students) 2 teachers
Private schools. Independent, well resourced.	2 schools 27 students played 1 focus gr. (7 students) 2 teachers	0
	Total: **16 schools** **213 students played WHACY** **9 focus groups (75 students participated)** **19 teachers interviewed**	

Summing up, 16 schools were visited, 213 students played WHACY and were observed, 9 focus group discussions with 75 students were held, ranging from 5 to 10 students per focus group, and 19 interviews with tourism teachers who also played WHACY and observed students playing it were conducted. All the focus group discussions and interviews were conducted in English, audio recorded and later transcribed. The transcripts were analysed by coding them using inductive thematic coding (Corbin & Strauss, 2008) through analysis software NVivo 10.

Phase 2: Tourism teachers' survey

The second evaluation phase was a survey with tourism teachers to obtain quantitative insights about their perceptions towards gamified application. The sample of the study was in-service tourism teachers in South Africa and the study adopted convenience sampling technique. The focus was on three provinces: Western Cape, Gauteng, Eastern Cape. Survey participants were asked to play WHACY game and to fill in the questionnaire reporting their perceptions about gamified application (Likert scale from 1 to 5, from strongly agree to strongly disagree).

The lists of the schools offering tourism subject in the respective provinces were obtained from the National Department of Education and the mailing lists were compiled (n=529 valid email addresses in 3 provinces). The survey was distributed via email addressing the school principal and asking to pass the survey information to school's tourism teachers. After two weeks the reminder followed, and after another week the telephone calls (n=80) were conducted to further invite tourism teachers to participate in the survey. Finally, the invitation to survey was distributed through tourism subject coordinators and advisers and their mailing lists. In total 218 teachers filled out the survey and 209 were retained after data cleaning (see Table 4 for sample demographics).

Table 4: *Demographics of the survey sample*

Gender	F (83%); M (17%)
Age	20-34 (13%); 35-49 (61%); 50-65 and more (26%)
Province	Western Cape (34%); Eastern Cape (31%); Gauteng (30%); Mpumalanga (2%); KwaZulu-Natal (1%); Northern Cape (1%); Limpopo (1%)
Language (mother tongue)	Afrikaans (37%); English (24%); isiXhosa (26%); isiZulu (3%); Setswana (3%); Sesotho (2%); Sesotho sa Leboa (1%); Other (4%)

The respondents were asked to self-declare their level of technology training: 7% reported having extensive, 17% moderated, 39% occasional and only 37% with no technology training. This implies that the respondents of this survey were exposed to technology and even 66% of the sample reported that they used technology for teaching purposes. Thus, the sample can be considered as technologically experienced, and the results of the study cannot be generalizable for the rural schools where internet connection and technological training and exposure is scarce. Only 9% of the respondents had previously used digital games/quizzes for teaching purposes.

Ethical considerations

Firstly, research approvals and permissions were obtained from the respective regional Education Departments. Secondly, principals of the selected sample schools were contacted to obtain their permission to visit the school and conduct foreseen research. Thirdly, all respondents gave their written consent to be interviewed or surveyed. They were informed that their participation was voluntary, anonymous and confidential. The main researcher commenced with fieldwork after becoming familiar with the context and environment (Sherry, 2008).

RESULTS

Engagement and learning opportunities: students' perspective

Overall observations proved that the quiz was easy to use and intuitive, none of the students experienced technological issues, even though 39% of participants reported that they have never used computers before. Two main themes emerged from the group discussions with students. First theme relates to gamification features of the application, which engaged students and made their experience enjoyable. Second, potential learning opportunities offered by gamified application.

Majority of the participants expressed excitement over the activity: "*It's not boring as studying from textbook, it's very interactive and exciting. It's a new thing for us, we usually don't do these things*" *(Student, WC Township school).*

The most engaging and triggering excitement features among the students while playing WHACY were:

• Aspect of **competition and score system**: "*You actually want to get it right because you are competing for points.*" *(Student, WC township school).* Competition made students try harder and invest efforts: "*When playing something like this, we get competitive, I don't want to have lower mark <…>*" *(Student, EC Township school)*

• **Immediacy of the feedback**: "*I liked how instantly the answer was given, usually when it is given at the very end it is not registered in your head. Its better to get it instantly*" *(Student, EC township school).* However, some students revealed that striving for higher score was distracting them from reading the feedback in textual format after each question. Students were mainly reading feedback in the instances when their answer was wrong. One student revealed that, according to her, the feedback was too long and she did not read it.

• **Visual aesthetics**: "*I liked pictures behind the questions. It was enjoyable <…> I also liked the background pictures because they were hidden hints*" *(Student, EC ex-model C school).* Students reported that pictures and videos were engaging, however, in more than a half of visited schools videos were not supported because of a lack or slow speed internet connection.

• **Challenge.** In several focus groups the aspect of challenge emerged. Students agreed that it was challenging at the right level: "*It was challenging in a good way*" *(Student, WC ex-model C school).* Which was influenced by the fact that students were able to relate to quiz's contents because of their tourism studies: "*I liked that I could connect to the content from tourism classes*" *(Student, WC Township school).* Only one student reported that the quiz was too easy for him. However, in several instances students were puzzled by the way the questions were structured, due to the fact that English was not their native language.

During the discussions students pointed out that WHACY has triggered their curiosity and willingness to learn even more about the related topics: "*<…> for the things I got wrong I will search the right answers and like this I learn the answers and maybe even more about it*" *(Student, WC Township school).*

Furthermore, students were suggesting that a playful quiz could become a complementary tool especially for content revision purposes: "*Would be nice to play something like this once a month. We learn things in class and instead of boring pen paper test we could do something like this*" *(Student, WC Private school).*

Regarding location where such application could be used, the mobility aspect emerged: "*I would like it on a phone, I could play it on a bus to school and learn. It could be syllabus related, you choose subject and it gives you a quiz, for revision would be cool*" *(Student, EC ex-model C school).*

Summing up, WHACY gamified learning experience was positively evaluated by students participating in the focus groups. However, engagement with ICT activities appeared to be a new practise for more than a half of participants, especially for the students from more disadvantaged schools. Going to computer lab for many of them was already an exciting experience in itself: "*It was nice to feel the technology in front of you*" *(Student, WC Township school).* In more

disadvantaged schools students reported: "*We are not used to be taught with technology, we don't use technology for learning" (Student, EC Township school).*

Engagement and learning opportunities: teachers' perspective

During the interviews with tourism teachers, potential learning opportunities of gamified application emerged, especially addressing students' low motivations and interest for the tourism subject. According to interviewed teachers, students rarely choose the subject because they are interested in it. After engaging with WHACY and observing their students playing, several teachers agreed that presenting contents in a more playful manner could increase their motivation to study tourism:

> *Would be very useful to introduce some chapters in a more playful way because they do enjoy it. They engage, I think it can even increase motivation in learning tourism (Teacher, WC Township school).*

Furthermore, potential conduciveness to learning was observed by teachers:

> *They really enjoyed it, I saw when they had their score going up they were screaming "yes, yes!" and that gave them courage to carry on. I would use it definitely, it makes you think broad as well as trial and error contributes to learning (Teacher, EC Township school).*

The teachers saw WHACY as a more engaging way to assess students' knowledge:

> *It could be used to test their pre-knowledge of the topic right at the beginning to see what they actually know and then to reassess them at the end, when they are done with the chapter (Teacher, WC Private school).*

The fact that application is self-driven was appreciated by teachers' because it did not require efforts from their side: "*It could even work as a revision tool, they could do it at home or on their phone" (Teacher, WC ex-model C school).*

209 tourism teachers also filled in a survey where they were asked to evaluate the application's characteristics in terms of rewards, challenge, playfulness and potential learning opportunities. Almost all respondents (99%) agreed that points were a rewarding attribute, 89% of the respondents agreed that immediate feedback was contributing to rewarding playing experience. 67% of the teachers agreed that the application offers flow experience and boosts confidence of the player when progressing through the quiz. Moreover, 72% agreed that the tool stimulated players' curiosity. 93% of the teachers agreed that WHACY quiz offers suitable level of challenge to the students: 81% reported that challenge closely matches to their computer skill level and 74% stated that challenge closely matches to their knowledge level.

Almost all respondents (97%) perceived the gamified application as a potential teaching aid for tourism subject, mainly (83%) as an assessment tool. Moreover, majority of the respondents (97%) perceived WHACY as bridging formal and informal learning settings, as the tool which might be used both in the classroom and outside of it (Table 5).

Table 5: Gamified application and tourism curriculum

	Strongly agree Agree	Neither agree nor disagree	Disagree Strongly disagree
As a teaching aid	97%	2%	1%
For assessment	83%	3%	4%
As a reward	45%	34%	21%
It might be a tool used both in the classroom and outside of it	97%	2%	1%

Table 6 summarizes the learning opportunities the platform offers as perceived by surveyed teachers. The results proved that teachers to a great extent perceived the platform as having potential to foster awareness about world heritage (99%) and enhance knowledge (94%). Moreover, 86% of the respondents agreed that the tool can increase interest in tourism subject and 83% agreed to the fact that the platform can motivate students to learn more about the heritage.

Table 6: Teachers perception of WHACY learning opportunities (strongly agree and agree values added)

Foster awareness about World Heritage Sites	99%
Enhance knowledge of World Heritage Sites	94%
Better visualize heritage places	94%
Increase interest in tourism subject	86%
Motivate students to learn more about heritage	83%
Better understand South African touristic potential	55%
Increase sense of pride of own heritage	46%
Increase sense of responsibility for heritage protection	17%

Barriers to using a gamified application

Moreover, tourism teachers were asked to identify the main barriers (Table 7) to introduce gamified application into formal tourism teaching practices. Survey (n=209) results revealed that the main barrier was lack of time: 78%. In the comment section the respondents explained that the tourism program is already full and there is a strong pressure of preparing students for the final examinations, thus introducing new methodologies or tools for learning is not a priority. Slightly less than a half of respondents (47%) put forward the barrier of lack of technological access in the school. In the third position (38%), the teachers positioned the barrier of their own lack of professional training on how to integrate technology into teaching practices and in the comments the wish to receive the training on how to incorporate gamified learning applications was expressed. In the comment section a frequent mentioned barrier was language, even though in the majority of South African schools tourism is taught in English, which is often second or third language to the students, thus having contents translated in local languages, according to the teachers, would enhance learning experience.

Table 7: Barriers for using gamified application in tourism classes

Lack of time during the class period	78%
Lack of access to technology in my school	47%
Low quality or lack of internet connection in my school	38%
Lack professional training on how to integrate technology into teaching	38%
Lack of technological assistance in my school	19%
Inflexibility of the current curriculum	11%
Technologically unprepared students	6%
My lack of power in deciding which strategies to use for teaching	3%

Interviews with teachers (n=19) echoed similar barriers as the survey: lack of resources (computer and internet connection), which causes logistical challenges to use computer labs due to low computer/student ratio as well as lack of ICT training. Furthermore, technology anxiety emerged as a strong impediment for ICT integration in general into tourism teaching. Some respondents revealed that they were uncomfortable and intimidated to use ICT because of age or lack of skills and experience.

> *I teach in the traditional method and it proved to be quite difficult when somebody suggests you can do this x, y and z with technology and I said 'oops', I don't know how to use this kind of media and I am just going to be in my little comfort zone (Teacher, WC private school).*

Furthermore, high penetration of mobile technology among students was identified as potential platform to engage with application, however, data cost challenge emerged:

> *Majority of kids have phones with internet, it could work as a homework, but the problem can be data and how much of data they have available. I think if student needs to decide if to use his data for this application or Facebook, Facebook might win (Teacher, EC Township school).*

DISCUSSION AND CONCLUSION

Students' engagement has been identified as a significant indicator of their academic success in South Africa (Council for Higher Education, 2010). Lack of engagement is considered as one of the factors contributing to poor graduation rates at the secondary and tertiary institutions in South Africa (Strydom et al, 2010; Titus & Ng'ambi, 2014). It is argued that increased engagement is likely to decrease apathy for the specific subject and even improve academic performance (Fitzgerald, 2012). A popular strategy to address lack of student engagement is introducing game elements into the learning process: the so-called gamification of learning (Kapp, 2012). However, as argued by Titus & Ng'ambi (2014:743): "To date, there is paucity of evidence within South African education system with regards to games and its impact on student engagement". Thus, this study attempted to illustrate that gamification elements can foster student engagement and facilitate conduciveness to learning specifically in tourism education within South African secondary education, which suffers from students' lack of interest and motivation (Adukaite et al., 2016).

The main goal of this paper was to present the *World Heritage Awareness Campaign for Youth (WHACY) in SADC*, a campaign dedicated to raise awareness and foster informal learning among Southern African youth about the heritage in their region as well as the sustainable

tourism. For the evaluation of the campaign a mixed methods approach was used. The qualitative insights from the focus groups with South African tourism students revealed that the most engaging features of the application were competition (through the scoring system), immediacy of feedback, visual aesthetics and challenge. Moreover, the gamified application triggered curiosity and willingness to learn more about the related topics among the students. The findings are in line with presented conceptual framework and previous research (Csikszentmihalyi, 1990; Kapp, 2012; da Rocha Seixas et al., 2016), underlying that elements of competition, challenge, feedback and visuals have potential to intrinsically motivate students and provide playful learning experience, which leads to greater engagement within the learning process. Although the study does not provide evidence that learning had occurred, it provides insights into potential of gamification and its nature to facilitate engagement and knowledge enhancement. However, for the majority of the participants' gamified learning was the first time experience, and in the disadvantaged schools going to computer lab was already an exciting experience in itself and this limits generalizability of the results.

Interviews and survey with South African tourism teachers revealed a great interest in gamified application's integration into the formal tourism curriculum. Gamified application was viewed as a more engaging assessment tool due to the multiple choice format. Teachers expressed positive attitudes towards gamified application recognizing its capacity to provide more motivating tourism learning experiences for students. Still, potential barriers to integrate application were identified such as lack of technical resources, limited availability of labs space and time. Moreover, despite positive attitudes towards ICT-enhanced tool within this study, technology anxiety and teachers' lack of confidence in using ICT was recognized as a significant barrier preventing the integration. The main source for low levels of confidence in using ICT is lack of skills and experience. This finding echoes extensive research on ICT integration within education in emerging countries and strong influence of teachers' low technology self-efficacy and anxiety (Fanni et al, 2013; Chigona et al, 2010; Agbatogun, 2010).

Additionally, mobile technology was recognized as having potential for usage of educational gamified applications because it is a highly pervasive technology in the region. Even though all visited schools had cell phone policies disallowing students to use them in the classroom, multiple teachers occasionally were making exceptions for tourism subject. However, teachers in township areas reported students' resistance to use cell phones for educational purposes due to the cost of data, as well as to limited skills.

Summing up, the gamified application appeared to mediate the engagement and facilitate space for learning within tourism classroom. This campaign highlights that gamification has potential in developing context as a catalyst for ICT and (in)formal learning initiatives. It should be noted that the study findings are based on self-declared data and it is only on one particular gamified application. Further research, especially longitudinal, would be useful to determine if gamification enhances learning using a variety of pedagogical methods.

REFERENCES

Adukaite, A., Van Zyl, I., Cantoni, L. (2016). The Role of ICT in Tourism Education: A Case Study of South African Secondary Schools. *eReview of Tourism Research (eRTR).* ENTER 2016 Conference of Information and Communication Technologies in Tourism: Volume 7 Research Notes.

Agbatogun, A. (2010). Self-concept, computer anxiety, gender and attitude towards interactive computer technologies: A predictive study among Nigerian teachers. *International Journal of*

Education and Development using Information and Communications Technology (IJEDICT), Vol. 6, Issue 2, pp. 55-68

Allais, S. (2014). *How Does Matric Measure the Health of our Education System?* Public Positions at the University of the Witwatersrand, Centre for Researching Education and Labour School of Education. Retrieved from: http://bit.ly/1MzuctG

Ali, A. and Frew, A. J. (2013). *Information and Communication Technologies for Sustainable Tourism,* New York: Routledge.

Boyle, E.A., Hainey, T., Connolly, T.M., Gray, G., Earp, J., Ott, M., Lim, T., Ninaus, M., Ribeiro, C., Pereira, J. (2016). An update to the systematic literature review of empirical evidence of the impacts and outcomes of computer games and serious games. *Computers & Education*, 94, pp.178-192. doi:10.1016/j.compedu.2015.11.003

Cantoni L., Kalbaska N., Inversini A. (2009). eLearning in Tourism and Hospitality: A Map. *JoHLSTE - Journal of Hospitality, Leisure, Sport & Tourism Education*, 8/2, pp. 148-156.

Chigona, A., Chigona, W., Kayongo, P., & Kausa, M. (2010). An empirical study on domestication of ICT in schools in disadvantaged communities in South Africa. *International Journal of Education and Development using Information and Communication Technology (IJEDICT),* Vol. 6, Issue 2, pp. 21-32

Council for Higher Education (CHE), (2010). *Quality, Effectiveness and Cohesion South African Survey of Student Engagement*, University of the Free State.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal performance*. New York:Harper and Row.

da Rocha Seixas, L., Gomes, A.S., de Melo Filho, I.J. (2016). Effectiveness of gamification in the engagement of students. *Computers in Human Behavior*. Volume 5, pp. 48–63. doi:10.1016/j.chb.2015.11.021

de Freitas, S., & Oliver, M. (2006). How can exploratory learning with games and simulations within the curriculum be most effectively evaluated? *Computers & Education*, *46*(3), pp. 249–264.

Deci, E., & Ryan, R. (Eds.) (2002). *Handbook of self-determination research*. Rochester, NY: University of Rochester Press.

Deterding S. (2012). Gamification: designing for motivation. *Interactions*, 19, pp. 14–17.

Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in education: a systematic mapping study. *Educational Technology & Society*, 18(3), pp. 1-14.

ESA (Entertainment Software Association) (2015). *2015 Essential Facts About the Computer and Video Game Industry.* Retrieved from: http://www.theesa.com/wp-content/uploads/2015/04/ESA-Essential-Facts-2015.pdf

Fanni, F., Rega, I., Cantoni, L. (2013). Using Self-Efficacy to measure primary school teachers' perception of ICT: results from two studies, *International Journal of Education and Development using Information and Communications Technology (IJEDICT)*, vol. 9, no. 1, pp. 100-111.

Fitzgerald H.E., Bruns K., Sonka S. T., Furco A., Swanson L. (2012). The Centrality of Engagement in Higher Education. *Journal of Higher Education Outreach and Engagement*, 16(3), pp. 7-28.

Gee, J. P. (2008). Video games and embodiment. *Games and Culture, 3*(3-4), pp. 253-263.

Hew, K.F., Huang, B., Chu, K.W.S., Chiu, D. K.W. (2016). Engaging Asian students through game mechanics: Findings from two experiment studies. *Computers & Education*, 92-93, pp. 221-236.

Kapp, K.M. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education*. San Francisco: Pfeiffer.

Kiili, K. (2005). Digital game-based learning: towards an experiential gaming model. *The Internet and Higher Education*, 8:1, pp.13–24.

Koutromanos G. and Avraamidou L., (2014). The use of mobile games in formal and informal learning environments: a review of the literature, *Educational Media International*, 51:1, 49-65.

Lee, J. J. & Hammer, J. (2011). Gamification in Education: What, How, Why Bother? *Academic Exchange Quarterly*, 15(2).

Malone T. (1981). Toward a Theory of Intrinsically Motivating Instruction. *Cognitive Science*, 4, pp. 333-369.

McGonigal J. (2011). *Reality is Broken: Why Games Make Us Better and How They Can Change the World*. Penguin Books, New York, NY.

Nah, F.-H., Zeng, Q., Telaprolu, V. R., Ayyappa, A. P., & Eschenbrenner, B. (2014). Gamification of Education: A Review of Literature. In F.- H. Nah (Ed.), *HCI in Business,* pp. 401–409.

O'Donovan, S., Gain, J., Marais, P. (2013). A case study in the gamification of a university-level games development course. *In SAICSIT '13 Proceedings of the South African Institute for Computer Scientists and Information Technologists Conference*, ACM New York, NY, USA, pp. 242-251. Doi:10.1145/2513456.2513469

Pedersen, A. (2002) *Managing Tourism at World Heritage Sites: a Practical Manual for World Heritage Site Managers*, World Heritage Manuals 1, Paris: UNESCO World Heritage Centre.

Prensky, M. (2005). Computer games and learning: Digital game-based learning. *Handbook of computer game studies*, 18, pp. 97-122.

Schieder T., Adukaite A., Cantoni L. (2014). Mobile Apps Devoted to UNESCO World Heritage Sites: A Map. In Xiang, Z. & Tussyadiah, I. (Eds.), *Information and Communication Technologies in Tourism 2014*, Springer, pp. 17-31.

Seaborn, K., & Fels, D. I. (2015). Gamification in theory and action: A survey. *International Journal of Human-Computer Studies*, 74, pp.14–31.

Sefton-Green, J. (2003). Informal learning: substance or style? *Teaching Education*, *14*(1), pp. 37–51.

Sherry, M. (2008). Insider/Outsider Status. In Lisa M. Given (Ed.), *The Sage Encyclopedia of Qualitative Research Methods.* (pp. 433-434). Thousand Oaks, CA: SAGE Publications, Inc.

Strydom, J.F.; Mentz, M. & Kuh, G.D (2010). Enhancing success in higher education by measuring student engagement in South Africa. Contextual challenges related to success. *Acta Academia*, pp. 1-13.

Sutton-Smith, B. (2001). *The Ambiguity of Play*. Cambridge: Harvard University Press.

Titus, Simone, Ng'ambi, Dick (2014). Exploring the use of Digital Gaming to Improve Student Engagement at a Resource Poor Institution in South Africa. *Proceedings of the European Conference on Games Based Learning*; Vol. 2, pp. 742-753.

Turkay, S., Hoffman, D., Kinzer, Charles. K., Chantes, P., & Vicari, C. (2014). Toward understanding the potential of games for learning: Learning theory, game design characteristics, and situating videogames in classrooms. *Computers in the Schools,* 31(1-2), pp. 2-22.

Umalusi (2014). Council for Quality Assurance in General and Further Education and Training. What's in the CAPS package? Tourism.

UNESCO (1972) *Convention Concerning the Protection of the World Cultural and Natural Heritage*, adopted by the General Conference at its seventeenth session in Paris, November 16, 1972.

Weaver, D. (2012). Towards Sustainable Mass Tourism: Paradigm Shift or Paradigm Nude? In Singh, T. V. (ed.) *Critical Debates in Tourism*, Bristol: Channel View Publications, pp. 28-34.

World Travel and Tourism Council (WTTC), (2013). *Travel & Tourism, Economic Impact 2013 SADC*. Retrieved from http://www.wttc.org/site_media/uploads/downloads/sadc2013.pdf

Woszczynski, A. B., Roth, P. L. & Segars, A. H. (2002). Exploring the theoretical foundations of playfulness in computer interactions. *Computers in Human Behavior*, 18, 4, pp. 369–388

Zichermann G., and Cunningham C. (2011). *Gamification by design: Implementing game mechanics in web and mobile apps*, Sebastopol, CA, O'Reilly Media, 2011.