16th Multi Conference on Computer Science and Information Systems

MCCSIS

19-22 July 2022
Lisbon, Portugal

Proceedings of the International Conferences

» ICT, Society and Human Beings 2022

» Web Based Communities and Social Media 2022

» e-Health 2022

Edited by
Piet Kommers
Mário Macedo

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international association for development of the information society

INTERNATIONAL CONFERENCES ON

ICT, SOCIETY AND HUMAN BEINGS 2022

WEB BASED COMMUNITIES AND SOCIAL MEDIA 2022

and

E-HEALTH 2022

part of the

MULTI CONFERENCE ON COMPUTER SCIENCE AND

INFORMATION SYSTEMS 2022

PROCEEDINGS OF THE INTERNATIONAL CONFERENCES ON

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and

E-HEALTH 2022

JULY 19 - 21, 2022

Organised by

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FULL PAPERS

ICT, SOCIETY, AND HUMAN BEINGS

FOREWORD

These proceedings contain the papers of the 15th International Conference on ICT, Society and Human Beings (ICT 2022), the 19th International Conference Web Based Communities and Social Media (WBCSM 2022) and of the 14th International Conference on e-Health (EH 2022), which were organised by the International Association for Development of the Information Society, from 19 - 21 July, 2022. These conferences are part of the Multi Conference on Computer Science and Information Systems 2022, 19-22 July, which had a total of 608 submissions.

The Network period in the evolution of computer technology is very much based on the convergence and integration of three main technologies; computer technology, tele technology and media technology. Telecommunication technology is playing a more and more dominant role in this convergence, especially internet and web technology. Embedded (ubiquitous) computer technology is making the process invisible, and media technologies converge within itself (multimedia and cross media). The convergence process is enforced all the time by smaller, cheaper, and more powerful components.

ICT and its applications are interacting with environments, roles, and processes which can also be modelled by converging circles. The process of social and psychosocial change and ICT from a global perspective is described graphically in the convergence model in figure 1 (Bradley 2006 Routledge) with concepts and their interrelations. Both "convergence" and "interactions" are important features in the model. Read from the left hand side in the model for the titles of some main tracks of the conference:

- Globalisation and ICT: When technology, economy, norms/values and labour market are converging on a global level, what are the hard questions? When the geographical space in the future will be both global and beyond – including virtual reality (VR) what is the state of art in research? (see the list of key words under ´globalisation´)
- Information and Communication Technology (ICT), next cluster of circles to the left in the figure, what applications contribute to desirable goals in the society?
- When Work Environment, Home Environment, and Public Environment are converging and the work and public issues tend to merge into the private sphere of our homes – what main changes in peoples Life Environment occur?.
- If the Professional Role (Work Life), Private Role (Private Life) and Citizen's Role (Public Life) converge forming a Life Role, what are the main social-psychologial changes?
- Four circles representing Virtual Reality (VR) are marked with dotted lines and are surrounding the set of converging circles. These circles reflect our participation in cyberspace on various levels. To the left part in figure we could talk about Virtual Worlds on the global level. Within the concept of ICT, the steps taken by applied Embedded and ubiquitous technology make technology more hidden to the individual and society as a whole.
Virtual Environments are already a common concept. Finally, we could talk about Virtual Human Roles, which could in more extreme forms be another personality that you play e g avatars. The converging circles are forming a Life Role and new life styles are being shaped.
- Effects on humans become more multi faceted and complex. Research focusing upon the individual is crucial i. e. research on how the use of ICT interacts with and impacts identity, social competence, creativity, integrity, trust, dependency etc.

A compass rose (card) for "Effects on Humans" (to the right) is used as a metaphor reminding us of the importance to keep the direction towards desirable human and societal goals and qualities at the development and use of ICT.
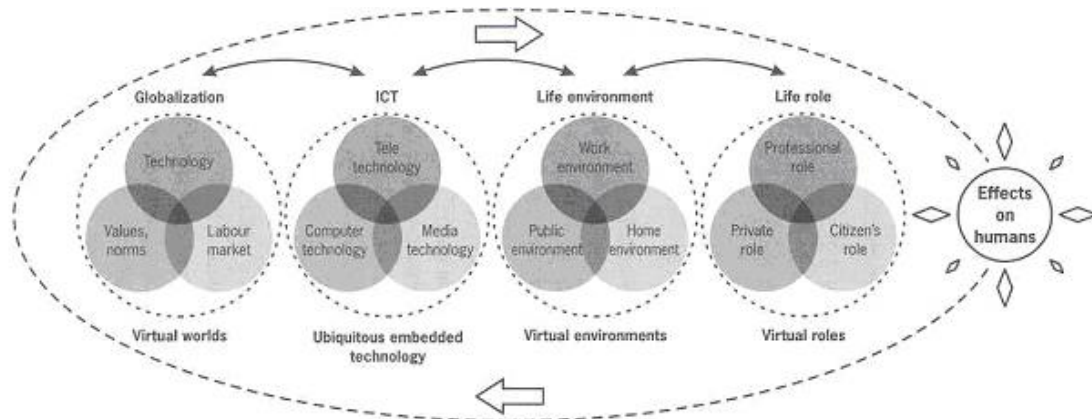

Figure 1. Convergence Model on ICT and Psychosocial Life Environment
(Source: Bradley, 2005, 2006)

ICT can provide tools for promoting sustainability (environmental, economic, and social sustainability) but can also be a threat for sustainability. Sustainability as a guiding principle involves system perspective, holism, human aspects, bottom up approach, common good, and equality. A change in focus regarding research and development is taking place. Analysis and design increasingly address both the work process and management connected to the sphere of production life and people's life environment. Analysis and design of ICT and societal systems both at local level and globally become important. What research in the field exists or is needed?

Community research in a broad sense comes to the fore – both physical and virtual communities. There is also a requirement to involve new and additional actors at the deeper and broader integration of ICT in the society (children, elderly, and consumer organisations). Educational programs on Community Informatics and Social Informatics are appearing in many academic institutions. Can a new infrastructure of the society be identified?

The effects of ICT on human beings as well as the interaction between ICT, individuals, and society are all within the focus of this conference. Both analyses of interactions and effects are important. Changes in behaviour, perspectives, values, competencies, human and psychological aspects and feelings are all of interest. Reflections on past, present, and future challenges – especially planning for handling the latter – are encouraged.

Today, computer science and ICT-related disciplines are working more and more together with various behavioural and social sciences including child psychology and developmental psychology. For this reason, the conference pays attention to societal changes, global and more local organisational and institutional changes, changes in values and in lifestyles, as well as individual cognitive effects and changes, motivational and emotional changes. It also appeals to solution-building in terms of desirable goals and actions for reaching a Good Information Society.

In general, all types of research strategies are encouraged, and especially cross-disciplinary and multi-disciplinary studies. Case studies, broader empirical field studies, theoretical analyses, cross-cultural studies, scenarios, ethnographic studies, epistemological analyses may all be presented.

The ICT, Society and Human Beings 2022 conference addresses in detail seven main aspects:
- Globalization and ICT
- Life environment and ICT
- Life role and ICT
- ICT and effects on humans
- Perspectives on ICT
- Desirable goals and ICT
- Actions for reaching the Good Information Society

Significant societal challenges in the form of demographics, urbanisation, climate change, resource crises and global competition are driving profound changes within our cities. In order to cope, governments and businesses are turning to 'smart city' concepts with the aim to enhance the efficiency of key infrastructure, utilities and services to create a sustainable urban environment that improves the quality of life for its citizens and enhances economic development. Smart cities are essentially built by utilising a set of latest information and communication technologies (ICT), including Wi-Fi and mobile networks, wireless sensors, the Internet of things, big data analytic tools, cloud services, mobile devices, and mobile apps. In this context, ICT as an enabling Smart City technology will generate radically new "smart" services and facilities. The UK's Department of Business, Innovation and Skills values the smart city industry at more than $400 billion globally by 2020.

The World Wide Web has migrated from information space into opportunities for social communication. Social Media are growing rapidly and play an increasingly important role in the development of Online Communities. They are all about identity, reputation, presence and relationships. Web based communities announce themselves both in your professional and private life through several new media such as LinkedIn, Twitter, Plaxo, etc. In order to keep you up to date with the pace of these new technological developments this Conference offers a dedicated overview and informative discussion on today's most relevant issues in new media for social life on the web.

Social Media are growing rapidly and play an increasingly important role in the development of Online Communities. Social Network Sites and Web-based communities announce themselves both in your professional and private life through new media such as Facebook, LinkedIn, Twitter, Plaxo, etc. Social media allow more dynamic roles in participation, virtual presence and online communities. These new ways to communicate via online social media have great societal effects and are motivating the creation of best practices to help individuals, corporations and authorities to make the best of it. It raises the awareness of the growing impact of social media and the influence of web based communities in today's users / consumers behavior; many organizations spend an increasing share of their budget in online social marketing strategies.

The mission of the Web Based Communities and Social Media 2022 conference is to publish and integrate scientific results and act catalytically to the fast developing culture of web communities, while helping to disseminate and understand the latest developments social media and their impact.

Submissions were accepted under the following main topics:
- The History, Architecture and Future of Virtual Communities
- Cyborgs, Teleworking, Telemedicine, Art Games and Learning Communities
- Virtual Communities for People with Special Needs
- Group Processes and Self-Organization
- Expanding Markets through Virtual Communities
- Collaborative Technologies
- Social Media

The use of ICTs (Information and Communication Technologies) in Healthcare Services is the main mechanism to improve efficiency and effectiveness. Nowadays ICTs are being developed to achieve the following objectives:
– To integrate heterogeneous systems;
– To develop frameworks to make all data meaningful, accessible and available everywhere and permanently;
– To develop AIDC (Automatic Identification and Data Collectors) systems;
– To develop intelligent systems to support clinical and management decisions;
The use of these technologies also improves the quality of patient care and reduces clinical risk. At the same time, the patient will be part of the healthcare process, having more information about diseases and access to his/her electronic health record.

The e-Health (EH) 2022 conference aims to draw together information systems, practitioners and management experts from all quadrants involved in developing computer technology to improve healthcare quality.

Submissions were accepted under the following 3 main areas in the field of e-Health within specific topics:

-Research Issues
-Management Issues
-Applications

These conferences received 188 submissions from more than 25 countries. Each submission has been anonymously reviewed by an average of four independent reviewers, to ensure that accepted submissions were of a high standard. Consequently, only 28 full papers were approved which means an acceptance rate of 15%. A few more papers were accepted as short papers and reflection papers. An extended version of the best papers may be published in the IADIS International Journal on Computer Science and Information Systems (ISSN: 1646-3692), IADIS International Journal on WWW/Internet (ISSN: 1645-7641), and also in other selected journals.

Besides the presentation of full, short and reflection papers, these conferences also included one keynote presentation from an internationally distinguished researcher. We would therefore like to express our gratitude to Professor Piet Kommers, UNESCO Professor of Learning Technologies, The Netherlands, for being our keynote speaker.

This volume has taken shape as a result of the contributions from a number of individuals. We are grateful to all authors who have submitted their papers to enrich the conference proceedings. We wish to thank all members of the organizing committee, delegates, invitees and guests whose contribution and involvement are crucial for the success of the conference.

Last but not least, we hope that everybody enjoyed the presentations, and we invite all participants for next year's edition of these conferences.

Piet Kommers, University of Twente, The Netherlands
ICT 2022 & WBCSM 2022 Program Chair

Mário Macedo, Universidade Atlântica, Portugal
EH 2022 Program Chair

Piet Kommers, University of Twente, The Netherlands
Pedro Isaias, The University of New South Wales (UNSW – Sydney), Australia
MCCSIS 2022 General Conference Co-Chairs

July 2022

UA INFORMA CONTRIBUTION TO ATTRACT PROSPECTIVE STUDENTS: AN EXPLORATORY STUDY

Margarida M. Marques and Lúcia Pombo
Research Centre on Didactics and Technology in the Education of Trainers (CIDTFF)
Department of Education and Psychology, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro,
Portugal

ABSTRACT

Student recruitment rates are essential for Higher Education institutions' sustainability. Universities may try to attract prospective students by providing information in their institutional website, advertising or offering campus visits, among other initiatives. In this line, the "UA Informa" is a project towards the promotion of extension activities for the community, to promote the image of the University of Aveiro (UA) and enhance education for sustainability. The project is relevant to UA students, prospective students, and other visitors. In this context, a set of open educational resources was developed to be accessed through QR codes spread across the campus. This exploratory study analyses the contribution of a non-formal game-based university campus visit into two dimensions: a) promotion of the institution's image; and b) students' satisfaction with the proposed activity. The game prompts the players to find nine points of interest with specific QR codes, resulting on a path through the campus. A total of 23 students attending grade 10, from a school out of the UA influence zone, participated in the campus visit. At the end, students filled in an individual and anonymous questionnaire exposing their opinion on the experience. The students revealed an overall favorable perception on the university and game-based campus visit, as they classified the activity as interesting and with good value for learning about the university. Nineteen students considered they would like to attend a UA course in the future (after grade 12), although many presented a neutral position regarding this possibility. This study indicates that the UA Informa may enhance the university image to capture prospective students, but its utility does not end here, as it may also facilitate the integration of students who attend the UA for the first time, and opens the university to the overall community. Furthermore, the QR codes are a visible and practical way to provide outreach and promote involvement of the community with sustainability issues, so it might have impact in the society sustainable habits as well.

1. INTRODUCTION

Student recruitment rates are essential for Higher Education institutions' sustainability, as their mission is usually focused on knowledge creation and teaching (Brock & Zhong, 2021). Universities may resort to a broad range of initiatives to stimulate and motivate students to enroll in their course offer, such as making information available through their institutional website, advertising or campus visits (Han, 2014). Campus visits are pointed as highly influential for students' choice of a postsecondary course and institution (Birch & Rosenman, 2019; Johnston, 2010).

One underexplored approach in campus visits is outdoor gaming, which can be supported by mobile technologies (Groff et al., 2015). For example, a literature review on mobile apps supporting campus visits retrieved only one work presenting an outdoor game approach (Andri et al., 2018). However, outdoor games are pointed as important for individuals' self-development and self-awareness and, when combined with collaborative approaches, they may strengthen their social relations as well (Baysal et al., 2022). Moreover, when game's wining conditions require working with other players, collaborative dynamics can also be promoted (Marques & Pombo, 2021; Robson et al., 2015). On the other hand, the competition between different groups created by games may increase students' engagement in challenging learning situations and improve their overall sense of enjoyment (Hwang et al., 2016).

As the access to mobile devices, such as laptops, tablets, smartphones and game consoles, increases in many educational contexts, the debate around concepts, such as Bring Your Own device – BYOD (Song, 2014) and Mobile Learning (Clarke & Svanaes, 2015), and their educational potential, become more acute. The potential of the use of the mentioned devices in educational contexts includes the development of digital competences by students. For example, a simple technology, such as the Quick Response codes (QR codes), allows students to develop meaningful and contextualized learning on curricular topics, while simultaneously gaining experience in the use of digital technologies (Uçak, 2019). Hence, and related with the pervasive access of student population to mobile devices, QR codes are becoming widespread in educational contexts as well. Their use can be directed at giving access to specific apps (either educational or generalist), so students may explore them for learning. QR codes can also be used to access desired information and contents, thus, preventing students from wasting time on search engines and find irrelevant or unreliable information. Other advantages include giving access to animated or interactive content, besides the prevention of paper wastage (Uçak, 2019).

When the digital content accessed through QR codes is freely available for all to explore, we face a truly democratization of education. In this line of thought, open educational resources (OER) gain relevance. These are educational materials available for the community under an open license that permits their use and re-use by anyone. By motivating students to take initiative in their learning, OER can support autonomous and ubiquitous learning, outside the classroom (Kim et al., 2020).

In this line, the "UA Informa" is a project grounded on a plural approach, articulating Education, Training and Research towards the promotion of extension activities for the community, including prospective students (Pombo et al., n.d.). The Education dimension is reflected on the aim of the project focused on the enhancement of education for sustainability for all; the Training dimension is translated into the involvement of Higher Education students in research projects in the area of Education, towards their scientific initiation; the Research dimension is based on the scientific investigation conducted in this project, under a social responsibility umbrella. The UA Informa project is integrated in the "Smart Knowledge Garden" and "Open Educational Smart Campus", which are programmatic projects of the Research Centre on Didactics and Technology in Education of Trainers (CIDTFF; https://www.ua.pt/en/cidtff/) of the University of Aveiro (UA), whose mission is anchored on the responsibility of research in Education to produce knowledge contributing to educate qualified and critical citizens, and to the creation of a better world.

Grounded on the social responsibility commitment, concerning namely knowledge-transfer practices and tools, the main aims of the UA Informa project are to promote the image of the UA and to enhance education for sustainability. The project endorses the participatory contribution of students, in initial and advanced training, so, at this stage, a student of High Degree in Basic Education was integrated into the research team of the UA Informa, for two years, under the PIC-Edu program. This is a program of initiation into research in the area of Education promoted by CIDTFF. The UA Informa team developed, tested and has been evaluating a set of multimedia OER, accessed through QR codes spread across the UA campus. The resources concern sustainability topics and are integrated in the UA Informa subweb (https://www.ua.pt/pt/uainforma), within the institutional Portal. The project opens the university to the broader community, but it has special interest to prospective students, UA students, particularly those attending the institution for the first time, and other campus visitors.

To promote the exploration of the resources, the team developed and implemented one non-formal university campus visit, entitled "UA Informa on Campus Sustainability", targeting secondary students. It is based on a quiz-game that prompts the exploration of QR codes installed in strategic points of interest in the UA campus, giving access to the UA Informa multimedia OER, towards the promotion of scientific literacy on sustainability issues (Pombo et al., n.d.). This work presents an exploratory study that analyses the contribution of the above described campus visit into the promotion of the institution's image, and the satisfaction of participating students concerning the proposed activity.

This document proceeds with the methodological options of the study, which integrates a mixed methods approach; the presentation and discussion of the main results; and finally, some conclusions are put forward.

2. METHODOLOGY

This exploratory study attempts to answer the research question: What is the contribution of a non-formal campus visit for secondary students, based on a quiz-game with QR codes giving access to multimedia OER towards sustainability learning, into two dimensions: a) promotion of the institution's image; and b) students'

satisfaction with the proposed activity. For that, quantitative and qualitative data were obtained from a questionnaire applied after the campus visit.

This section comprises three subsections: i) an introduction contextualizing the campus visit; ii) data collection methods and data analysis; iii) participants brief description.

2.1 The Campus Visit "UA Informa on Campus Sustainability"

The UA Informa campus visit comprises three main stages of development: i) the creation of multimedia OER integrated in the subweb UA Informa; ii) the development of an outdoor game, with QR codes that give access to the above-mentioned educational resources; and iii) the implementation of the UA Informa resources with secondary students, that is, students' exploration of the OER in a game format campus visit.

In the first stage of development, the UA Informa team created a set of multimedia OER covering sustainability topics presented on a manual published by the UA group for sustainability: Energy, Water, Paper and Plastic, Waste, Mobility, Food and Green Events. Each section presents relevant impacting information, based on credible sources, illustrated with appealing images and small videos, which were conceived and produced by Higher Education students, under the supervision of experienced researchers. Moreover, the videos exhibit also sustainability actions and strategies that can be adopted on the campus (Figure 1).
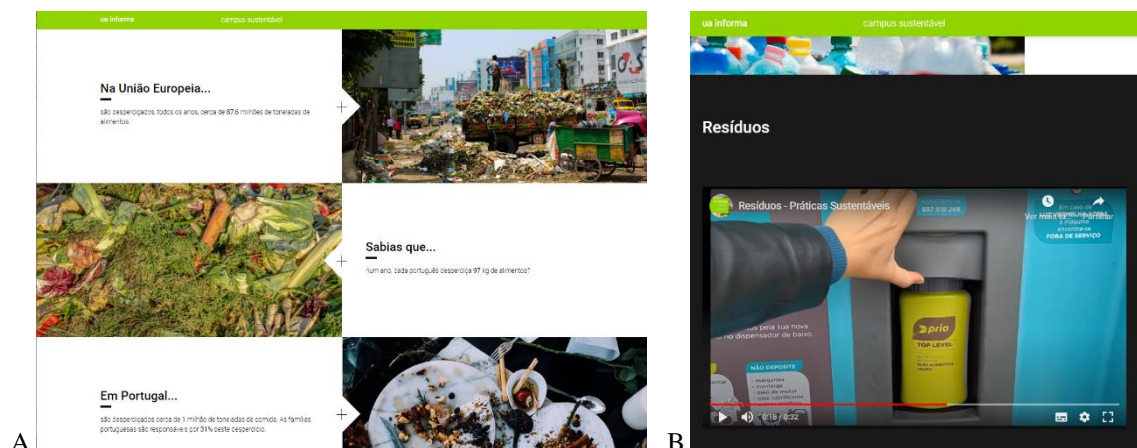

Figure 1. Open educational resources on the UA Informa subweb (https://www.ua.pt/pt/uainforma)
A: texts and images regarding food waste; B: video featuring a cooking oil recycling bin at UA

UA's Communications, Image and Public Relations Services mediated the Rectory's authorization to publish the resources in a subweb of the university's portal that was created for this purpose: the UA Informa subweb (https://www.ua.pt/pt/uainforma). Furthermore, authorization was also given by the institution Rectory for the installation of a set of QR codes giving facilitated access to UA Informa OER, accordingly to their relevance to specific points of interest on the institution main campus. The installation of signals with the QR codes throughout the campus draws the attention of the passersby to sustainability issues, related to each visited point of interest. This instills curiosity about the information contained therein, which is quickly accessed by reading it on a mobile smartphone with a simple QR code reader. These contents are not static nor merely informative; they can provide moments of interaction between users and sustainability actions on campus.

In a second stage of development, the team created a peddy-paper game presented in a flyer. It starts with an informative section with the goals and instructions to play the game, and also a map with all the points of interest that comprise a path on the campus. Hence, the game prompts teams of players to find nine points of interest in the campus: 1- Rectory, 2- UA Informa, 3- Paper and plastic, 4- Waste, 5- Energy, 6- Green events, 7- Water, 8- Food, and 9- Mobility. In each point of interest, players must find a specific QR code to access a specific UA Informa OER comprising useful information in textual, image and video formats. For each point, three multiple choice questions with four answer options are presented, summing up to 27 questions in the game. The first question in each point of interest requires players to read, interpret, and select textual information. The second question involves the access to information presented in video, which usually includes actions and strategies people can take to reduce their environmental footprint in the campus. In the third

question, players must observe their surroundings. Each correct answer is valued with one point and a score is kept, to find the winner team.

In a third stage, in order to test and evaluate the OER and outdoor game, a campus visit activity was offered to the community under an annual event targeting basic and secondary students, promoted by UA. The event, the XPERiMENTA, is the largest annual extension event of UA designed to demonstrate its skills, such as the training offer, as well as to present its conditions of study, research, personal and social development. Students are invited to work on hands-on activities, interactive projects, science shows and guided tours in the campuses.

Twenty-three secondary students (15 to 17 years-old), from a school outside of the UA influence region, participated in the UA Informa game-based campus visit under XPERiMENTA event, in teams of two or three, during 45 to 60 minutes. At the end, students filled in an evaluation questionnaire and certificates were distributed to all participants, as well as small prizes for the teams with the best performance.

2.2 Data Collection and Analysis Options

Data collection involved inquiry through a questionnaire collecting participants' perceptions regarding the campus visit activity. The questionnaire was developed to sustain a discussion about the informative and educational contribution of the UA Informa. Thus, the following dimensions where considered: i) sustainability learning value of the game; ii) informative value to know the UA infrastructures and conditions for the academy; and iii) activity appraisement. Hence, the questionnaire included three sections devoted to these dimensions and one additional section to briefly characterize the participants socio-demographics (age, gender, school year, and the area of the high degree course the respondent would like to attend in the future). However, as the section "i)" was analyzed in previous work (Pombo et al., n.d.), in this study the focus is on the remaining dimensions: "ii)" and "iii)".

The part of the questionnaire regarding the informative value to know the UA infrastructures and conditions for the academy included 6 closed-ended questions in 5-points Likert scale, from "totally disagree" to "totally agree". This part is followed by one section regarding the activity appraisement. This last part included 6 closed-ended questions in a similar scale, and contained as well one closed-ended question in a 5-points Likert scale, from "very uninteresting" to "very interesting". This part also included an open-ended question, where students should complete three sentences: "In this activity, I liked ….", "In this activity, I did not like…" and "I think this UA Informa campus visit is …"

Quantitative data was analyzed through descriptive statistics with graph creation. Qualitative data from the open-ended questions were analyzed through descriptive analysis and presented in a table format.

All data was collected anonymously and students participated in this study voluntarily.

2.3 Participants Brief Description

The group of 23 secondary students that participated in the campus visit attended grade 10. From these, 11 students were 15 years-old, 10 students were 16 years-old and 2 students were 17 years-old. Regarding gender, 14 were female and 9 were male. About one quarter of the students (6) mentioned they did not know what course they plan to apply for post-secondary education. Other 6 students mentioned they desired sciences courses with no specification, 5 preferred medicine courses and the remaining mentioned a diverse set of areas: education, economy, multimedia, sports, engineering and no course desired (1 each).

3. RESULTS AND DISCUSSION

This section presents and briefly discusses the results of this study that focuses on the analysis of the contribution of a non-formal game-based campus visit into two dimensions: a) promotion of the institution's image; and b) students' satisfaction with the proposed activity.

3.1 Promotion of the Institution's Image

Graph 1 presents the students' opinion about the UA Informa campus visit value for the UA promotion. It reveals an overall favorable perception about the university. The first question (3.1.) showed that the campus visit supported by a mobile device was one unexpected experience, as 14 students (totally) agreed that, before this activity, they did not imagine they could use cell phones to learn more about UA. Moreover, most students considered that this activity allowed them not only to know the UA campus a little better, but also to know important places (questions 3.2. and 3.3.). Among the visited places are the Rectory building, the canteen, the book shop, bicycle park, recycle station, and several departments in the main campus.
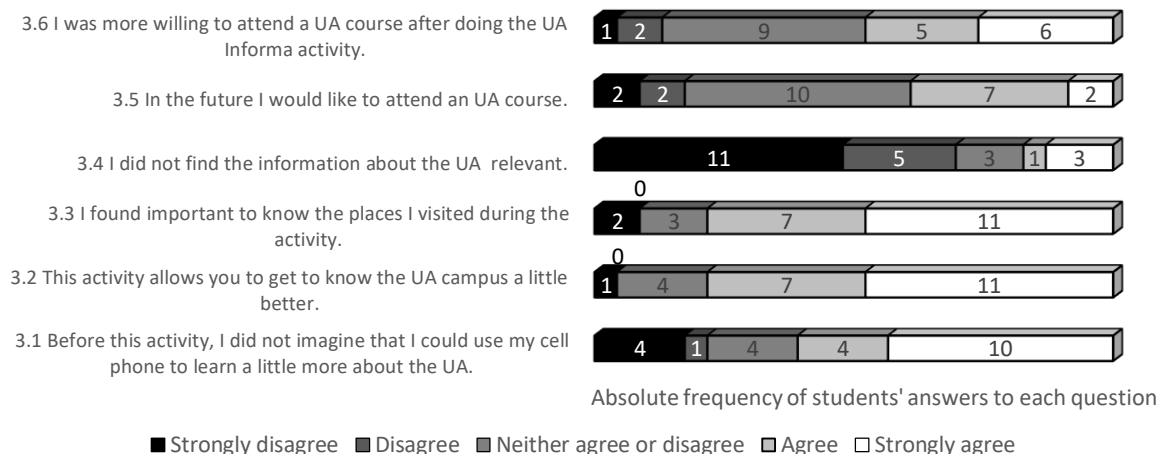
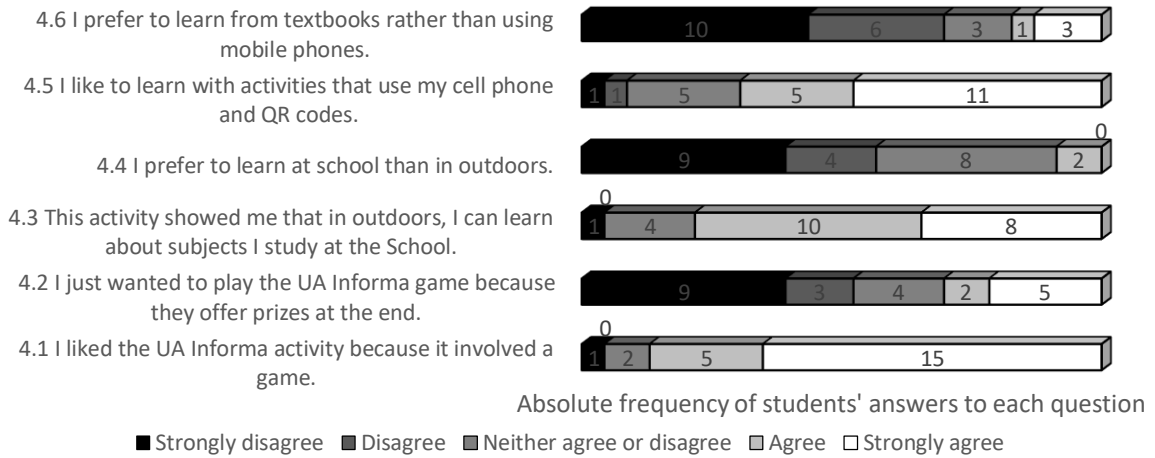Graph 1. Secondary students' opinion about the UA Informa campus visit value for the UA promotion

In the question formulated in a negative way (3.4), most students disagreed, indicating that students considered the information about the UA relevant. Finally, the questions concerning their will to attend the UA institution in the future (3.5 and 3.6.), gathered the highest number of neutral answers (neither agree or disagree). This seems to be in accordance with the students' answers to the course desired. Maybe related with the grade students are attending (10th degree), there seems to be some undefinition regarding their post-secondary education, as half the students either did not know or mentioned a very broad area, as Sciences. Nevertheless, 11 students showed that the activity increased their willingness to attend UA in the future. This result supports the literature that reports campus visits as highly influential for students' choice of a post-secondary course and institution (Birch & Rosenman, 2019; Johnston, 2010).

3.2 Students' Satisfaction with the Proposed Activity

The participant students' global satisfaction with the campus visit is presented in Graph 2, which reveals an overall good perception. For instance, most students appreciated the game-based format, as 15 strongly agreed and 5 agreed with the sentence "4.1. I liked the UA Informa activity because it involved a game." Moreover, the appreciation of the activity does not seem to be linked with the small prizes offering at the end, as half of the students (strongly) disagreed with the related sentence (4.2).

The outdoor learning feature seems to be appreciated by students, as many acknowledged they can study curricular topics outside the school, which is revealed by 18 (strong) agreement answers in the sentence 4.3. Students also mentioned they prefer to learn in the outdoors, rather than in school, as 13 respondents (strongly) agreed with the sentence 4.4.

The mobile technology also seems to be appreciated, as students mostly mentioned liking to learn with cell phones and QR codes (16 respondents) and preferring to use mobile devices, rather than textbooks to learn (16 respondents), as revealed by their answers to 4.5 and 4.6. questions.

4.6 I prefer to learn from textbooks rather than using mobile phones.
4.5 I like to learn with activities that use my cell phone and QR codes.
4.4 I prefer to learn at school than in outdoors.
4.3 This activity showed me that in outdoors, I can learn about subjects I study at the School.
4.2 I just wanted to play the UA Informa game because they offer prizes at the end.
4.1 I liked the UA Informa activity because it involved a game.

Absolute frequency of students' answers to each question

■ Strongly disagree ■ Disagree ■ Neither agree or disagree □ Agree □ Strongly agree

Graph 2. Secondary students' global satisfaction with the activity

Students' acceptability of this outdoor game-based format supported by mobile technologies is not yet reflected on the literature, as campus visits combining these features are not frequently reported (Andri et al., 2018; Groff et al., 2015).

Considering students opinions regarding the UA Informa activity interest, the majority classified it as very interesting (16 respondents) or interesting (4 respondents), as revealed in Graph 3. No student selected a (very) uninteresting answer.

I found the UA Informa activity was…

■ very uninteresting
■ uninteresting
■ neither interesting or uninteresting
□ interesting
□ very interesting
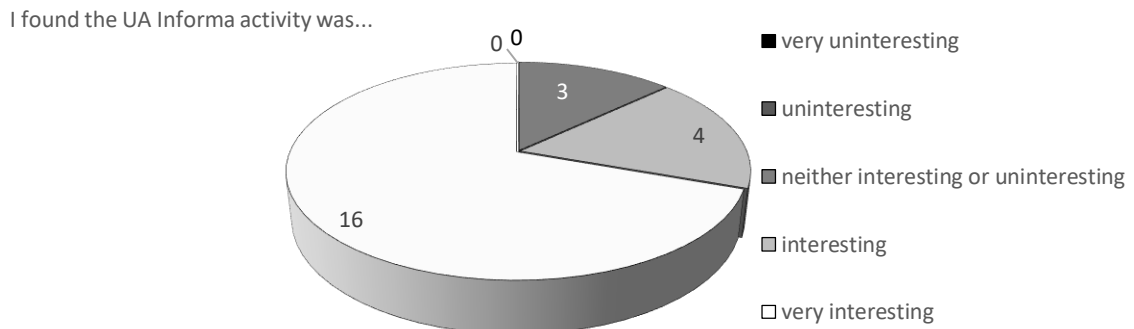
Graph 3. Secondary students' appraisal of the activity interest

Regarding the open-ended question, students overall revealed a very positive perception about the UA Informa campus visit (Table 1). For instance, they mentioned having enjoyed the exploration of the buildings and to get to know the university campus (11 answers), while having a fun experience (5 answers), in spite of the too sunny weather conditions (14) and the prompt to walk around the campus (4 answers). In general, students reinforced their evaluation of the activity as interesting (6 answers) and fun (3 answers), and acknowledged the activity learning value and importance (3 answers each). It is worth mentioning that the activity ran in the Spring, after 11 a.m., in a hot day.

Table 1. Students' answers to the open-ended question about the UA Informa campus visit

Category	Frequency	Citation
I liked…		
…the outdoors and to know the UA	11	"…to explore all the buildings and to know the university"
…having fun	5	"…to do very fun activities"
…the experience	1	"…of the experience, a lot of sympathy and it was innovative"
Unspecific answer	5	"…everything"
I did not like…		

Category	Frequency	Citation
…the weather	14	"…being very hot"
…to walk	4	"…having to walk"
Unspecific answer	5	"I have nothing to point out"
I think this UA Informa campus visit is…		
…interesting	6	"…very interesting"
…learning promoter	3	"…innovative and deepens our knowledge"
…fun	3	"…very fun"
…important	3	"…important and necessary"
Unspecific answer	8	"…different"

4. CONCLUSION

The exploratory study analyses the contribution of a non-formal game-based campus visit into two dimensions: a) promotion of the institution's image; and b) students' satisfaction with the proposed activity. The game is supported by mobile devices that are used to access OER on sustainability issues accessible through specific QR codes in nine points of interest in the campus. The activity was implemented in an annual event targeting basic and secondary students, promoted by UA.

A total of 23 grade 10 students participated in the study and revealed an overall favorable perception on the university. Students considered the campus visit allowed them to know important locations of the campus (such as the Rectory building) and to learn relevant information about the university. From the 23 students, from a school out of the influence zone of the institution, 19 considered they would like to attend a UA course in the future, although many (10) presented a neutral position regarding this possibility. Considering students' school year and undefinition about their desired post-secondary course, the high frequency of the neutral position is not surprising. It is also worth noting that these students have several other higher institutions geographically closer to their home city. Other issue to highlight is that almost half of the students acknowledged that the campus visit increased their willingness to attend UA in the future.

In what concerns students' satisfaction with the activity, they revealed also an overall positive perception and they classified the activity as interesting (4 answers) or very interesting (16 answers). Students mentioned having appreciated the: i) outdoor game format, making this a fun activity, ii) learning sustainability issues in the outdoors, involving topics they study at school, and iii) use of their own mobile devices in this type of activity. Facing these results on student acceptability of outdoor game-based campus visits supported by mobile devices, which are unusual features in this type of institution promotion (Andri et al., 2018; Groff et al., 2015), higher education institutions should consider to explore this approach. This recommendation becomes more relevant when considering the benefits of outdoor games for players pointed in the literature, namely personal self-development, increased digital competence, and engagement in challenging learning situations (Baysal et al., 2022; Hwang et al., 2016; Marques & Pombo, 2021; Robson et al., 2015; Uçak, 2019). Institutions can also consider that students may not appreciate too sunny weather conditions, and program these visits preferably outside the hotter hours of the day.

From the results, this exploratory study indicates that the UA Informa project may enhance the university image to capture prospective students. This is supported by the fact that the participant students, from a distant geographical region, mentioned they are open to attend the university in the future (after year 12). These results are in line with the literature, where campus visits are documented as highly influential for institution choice by prospective students (Birch & Rosenman, 2019; Johnston, 2010).

In addition, the project may also facilitate the integration of students who attend the UA for the first time, as they are supported in getting to know the campus infrastructure and functioning. However, as the QR codes are permanently available on the campus, any passerby with a smartphone can explore the OER on the UA Informa subweb, thus opening the university to the overall community. Furthermore, the QR codes are a visible and practical way to provide outreach and promote involvement of the community with sustainability issues, so it might have impact in the society sustainable habits.

This was the first experience of implementing this campus visit. Hence, the number of participants is small and does not allow the generalization of results, which was not the aim of this study. The intention was to enhance the discussion about the contribution of the game format articulating OER accessed through QR codes to the university image promotion, whilst making sure this activity is satisfactory for the participating students.

Further work involves the exploration of the UA Informa resources in new activities, for an extended target public, involving adults. Moreover, it is previewed to expand the UA Informa subweb with new themes and new games, and also to disseminate results.

ACKNOWLEDGEMENT

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