

Social Inclusion of Young Marginalised People through Online Mobile Communities

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Abstract—Youth exclusion is widespread and increasing across Europe. Information and communication technology (ICT) has the potential to serve as a gateway to social inclusion. However, computer and internet access of marginalised young people are limited. Alternative methods to approach them through ICT are needed. The interdisciplinary project ComeIn (Online Mobile Communities to facilitate the Social Inclusion of Young Marginalised People – EU FP7) studies and utilises mobile networks as a means for social inclusion. This approach combines the benefits of the online community concept with an inclusive approach, realised through the most abundant device used by marginalised youth in Europe – mobile phones.

I. INTRODUCTION

LIFE for young people in contemporary society is both challenging and uncertain, their individual life courses are less predictable and more individually framed than before [8]. At the same time the youth face a decline in the stability of social structures such as family, work and social security and a loosening of the ties between structures such as education and employment [16]. With an increased diversity in household and family life, a process of individualisation is growing and mechanisms of responsabilisation force individuals to reach suitable decisions. Because of this, risk is individualised and responsabilises young people for an “effective management”, a self-regulation towards the present norms of society. Those who fail will be “excluded, marginalised and demonized” [8, p. 23]. A approaching young marginalised people is challenging – their exclusion from society and societal resources has created a feeling of rejection. This leads to a lack of trust and unwillingness to take part in the framework of normative organisations. There is therefore an urgent need to seek for new innovative methods for approaching young marginalised people and for fostering their reintegration into societal circles. Communication technologies provide a new method of implicit belonging and may potentially serve as an inclusion tool for marginalised youth refraining from explicitly belonging to a specific organisation. However, marginalised young people often experience difficulties, in this regard, associated with limited internet access [9]. These difficulties limit their ability to enjoy the social and professional benefits offered by quickly evolving information technologies and further contribute to their exclusion. Moreover, such limited ICT accessibility also limits the au-

thorities’ ability to offer marginalised youth an inclusive solution leveraged by this media. Mobile networks and telephones could serve as the main infrastructure for social inclusion.

II. CONCEPTUAL FRAMEWORK

A. Definition of Marginalised Youth

No congruent terminology referring to marginalisation or being at risk of social exclusion exists. Terms differ according to contexts and perspectives and also in their connotations. Some terms used are no longer considered as adequate because they contribute to further stigmatisation. For the ComeIn project the consortium agreed on the following definition for marginalised youth as “young people with fewer opportunities”. This term is used to define the broad target group of the social inclusion efforts of the European Commission’s YOUTH Programme. Forms and dimensions of marginalisation differ and a range of causal or risk factors contribute to cumulating disadvantaged situations of vulnerable youth. Disadvantage is interrelated, clustered and reproduced [12]. Multi-disadvantaged young people are therefore forced to contend with a plurality of obstacles but, at the same time, have relatively few resources to do so. Only when a youth “has a weak position in a number of arenas simultaneously can we talk of marginalisation. Such positions limit their access to economic, social and political resources” [6, p. 48].

B. ComeIn Target Group

The ComeIn-Study focuses on marginalised young people aged between 14 and 21 years old across Europe, affected by two broad but specific categories: Education and Economy – young people with educational and income determined barriers. Therefore the target group is defined as youth

- of compulsory school age but outside formal education
- post-compulsory school age and not in education, employment or training {NEETs} [4,5].

C. Statistics on marginalised youth use of mobile phone

The mobile phone is central to the lives of young people of various social, economic, educational and cultural groups. In the UK, for example, 97% of female and 92% of male 11-21 year olds have access to a mobile phone [11]. A

report published by Nestle's Social Research Programme utilised qualitative and quantitative measurements to explore the usage of Mobile phones across youth. The study discovered that mobile phones are a vital tool for young people's social lives. Enhancing this social attribute of mobile phones by introducing online mobile communities, as it is intended to do by using the ComeIn platform, is expected to further serve the need of youth to belong to a community, both explicitly and implicitly.

Secondly, youth describe their phone as a part of their person and identity. More than four fifths of females, and seven out of ten males, 'could not bear to be without' their mobile phone.

Thirdly, managing mobile phone communication is partly perceived as a matter of performing a task but it is also a matter of expressing one's identity and style. The highly visible action of using the phone, and the ever-present need to be part of the virtual community and to have access to it, are more than just an effective use of a tool. There are also 'style' issues. Many young people 'personalise' their phones with a background screen image (67%), a downloaded ring tone (58%), or a snap-on cover (36%). The tendency of youth to use mobile phones as a means of self expression indicates the potential acceptance of user generated content capabilities, such as the ones that will be offered by the ComeIn platform [15].

III. METHODOLOGY

A. Socio-scientific analysis of marginalised youth

A conceptual and analytical framework for analysing marginalised young people lays the ground for future work in the ComeIn project. Firstly a desk-top research builds a reflection and compilation of the state-of-the-art of research in this field. It starts with an analysis of different terms of marginalisation and of marginalised young people that are commonly used in academic literature. This enables a common understanding and shared view of terms used in the project. Different forms and types of marginalisation are investigated, with a more detailed look at socio-economic as well as educational determinants that have an impact on the phenomenon of marginalisation particularly of young people. It also contains an assessment of access to and use of technology of marginalised young people. Particular attention is paid to the use of the Internet in terms of the Digital divide affecting underprivileged young people and to the use of mobile phones.

Secondly empirical results out of expert interviews and focus groups are used to identify particular problems related to marginalisation in its interplay with ICT. The pool of experts for the interviews is composed by both practitioners who are currently working with affected youth and academics who are involved in related research activities, either marginalised youth and/or the use of ICT. The results of focus group discussions with representatives of the ComeIn target group namely the marginalised youth themselves compliment and evaluate the theoretical results. Valuable conclusions drawn from the investigated topics

help to specify requirements that should be met by the mobile platform of the ComeIn project.

B. Exploratory research of online communities

The analysis focuses on defining those aspects of online communities for marginalised youth which can be transferred to a mobile context. A review of the published literature identifies the common characteristics of successful online communities to assist the ComeIn project to attain its overall aim of designing and implanting a mobile platform for marginalised young people. Existing literature on online communities, both formal and informal is examined and a list of their features is provided. The desk research identifies common characteristics in successful online communities which build the basis of group discussions later on.

The research also examines online communities which exist specifically for the 14 to 21 years age group and focuses on the existing use of online communities by young marginalised people.

A round table of practitioners discussed the identified characteristics that were expanded in the light of their opinions and experiences. The group consisted of facilitators, technical developers, researchers and users. The discussion particularly emphasised on the transferability to mobile devices.

Focus group discussions with target group members who are active users of online communities asked for their perception of the uses and the limitations of results gathered before. Outputs are guidelines for a mobile online community including needs, requirements and priorities of users. Results of interviews and focus groups are already available in form of project reports at the project website www.comein-project.eu.

C. Content design

An essential of today's online communities are multimedia additions to content which at times become the sole content of the community (YouTube, MySpace). In order to import the concept of lively online communities to the mobile dimension, a mobile networked media platform with a number of key technological elements needs to be developed. These elements include improved video streaming capabilities via mobile phones, adaptation of content to the mobile domain, management of- and access to- video files of multiple sources and the user interface. In order to attract the target group and allow them to feel "at home" in the environment of a mobile community, the opportunity to include and integrate video content is essential.

The added value of an online community to marginalised young people is focused on the use of a daily way of communication amongst marginalised young people. Users do not have to get used to a new platform, software, or protocol, so that we can work on their context, but from a different view and complementary objectives.

According to the focus of the ComeIn-project on its target group of young marginalised people with educational and income determined barriers the project works on two exemplary contents: First concerning learn to learn and second concerning entrepreneurial skills. The project applies two different content packages suitable for use on a mobile de-

vice as part of an inclusive online community. The project works on the characteristics of the interface of the online mobile community and the characteristics of the interface of the content packages. Based on the exploratory research and literature reviews in previous project phases, an in depth analysis is carried out. Quantitative and qualitative methods are used to capture the user requirement and develop a needs analysis. Survey methods are specifically tailored to potential constraints of the target group. The survey takes place in the two participating project countries UK and Austria. Results of this survey will be discussed in additional focus groups that are organised in each of the participating project countries (see project participant’s description below). A pedagogical framework, alongside the research guides the specification for the content of packages, and is iteratively refined by feedback from potential user groups. An additional expert group discusses the possibility of adaptation of the content packages for use with marginalised groups in other European countries. Work is resulting in a final content specification which is the basis for the set up of two pilot content plots which are carried out by professional creative producers who are specialised on mobile contents.

ventional education institutions [1]. Mobile learning offer new opportunities to provide information and services to young people, specifically those who are on the edge of society. New pedagogies are developing with digital technologies which reflect collaboration, internalised thinking, reflection and iteration, but access to marginalised groups through mobile technology to date has not been part of these developments.

The ComeIn project maps the creativity and ingenuity that these young people daily demonstrate onto citizenship, parenthood and employment through the development of dynamic content accessible through mobile technology and online community.

Web based educational content proliferates, often providing distance learning which is little more than a delivery model offering a digital version of what can be achieved from the study of traditional texts with little flexibility, less portability and often at greater expense. Whilst "content push" models are the norm, interaction is often confused with participation and learning opportunities reduced to multiple choice questions or a small range of community tools which fail to recognise the changing culture of learning in the digital age. Internet literacy permits the user to become an active producer as well as receiver of content enabling interaction and participation online. The challenge for educators is to define emerging pedagogies in terms of 21st century skills where the ability to use new technologies and to shape social communication and interaction using a range of multimedia tools will define success in the future.

Research findings from the 4500 young people participating in Notschool.net has demonstrated that the most effective learning occurs where the learners’ interests are aroused and their pathway meets their needs. In some ways the notion of delivery and community are in juxtaposition, since the social exchange in community supports discussions and dialogues leading to active participation in content related tasks. Learners benefit from community membership where they are involved in dialogue, exchange and collaboration.

Within a learning community, the learners gain more self-confidence and control. The community provides them with the sense of a learning space with its shared experience of goals, cooperation and support. That sense of community serves to define a range of user-led and peer generated content with common characteristics. This in turn provides the scaffolding for the learning space. For this reason, generic and specific content packages will be developed which involve and reflect the needs of learners from the various marginalised groups identified [14].

B. Mobile networked video platform

The world of mobile content is looking to mirror the content world of Internet based services. The message of WEB 2.0 and user generated content (UGC) combined with the highly attractive prospects of video based content has sown the seeds for the development of new and interesting mobile content platforms [3].

At the same time, end users are seeking on the one hand, a convergence of mobile and internet content, to allow them

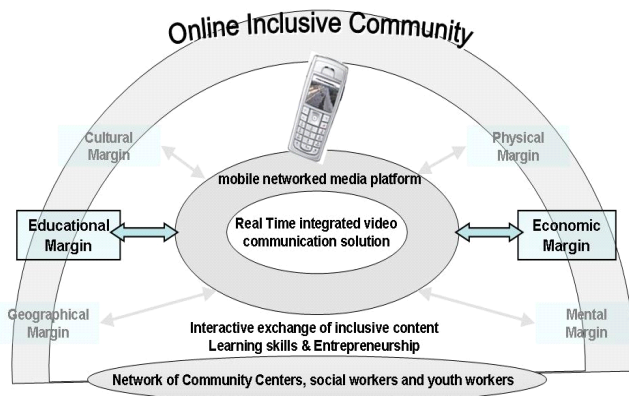


Fig 1. ComeIn Document of Work, 2008

IV. MOBILE PLATFORM INFRASTRUCTURE

A. Online inclusive communities for marginalised youth

The growth of free ubiquitous ICT supported by multinational corporations in retail outlets offers new opportunities for free internet access. In addition the expansion of web 2.0 services and the growth of internet sites like "YouTube" mean that the majority of under 30s are used to both viewing and contributing new media. This is not simply a passive delivery market but a participative model [13]. Despite this, some groups continue to be marginalised, and these young people are represented by an educational, cultural and digital divide [10]. With the focus on young people without education or employment, there is a need to develop vocational guidance, tools and enterprise services to satisfy their certain needs which are not met by regular and con-

to carry their personalised community with them – wherever they go. And on the other hand, a richer and more vivid world of content on their mobile devices, which caters to their wish for creation of online personas.

C. *The architecture of mobile online communities*

Concerning the community architecture the project team can rely on the experience of previous online learning communities set up by the project partners of ComeIn, especially of Inclusion Trust in the UK [7] (see project participant's description below). Amongst other projects their team had worked out Notschool.net. This software design was based on the experience and understandings developed in the earlier projects. The Notschool.net project, designed and implemented by the Inclusion Trust team over 7 years has involved 3500 marginalised youth and their families from England, Scotland, the Channel Islands, Australia and New Zealand. Proof of concept has been established and the team is advising other countries in the build of complimentary projects to support local cultural needs. There are few truly inclusive online communities which are scaleable. There is no other longitudinal research on this scale anywhere else in the world.

Notschool.net research identified the key features of the successful design and build of inclusive online communities which are internet based [2]. The findings have also identified key barriers, for the ComeIn target groups these are likely to be cost and access. Furthermore hardware must be robust and reliable. Architecture must be reliable and media rich rather than based on traditional literacy.

Due to this the team still works on a "recipe" for online community for marginalised youth. A key finding is the close involvement of the key stakeholder population in the design and build.

Inclusion Trust, through the Notschool.net project, is recognised as a worldwide authority on re-engaging marginalised youth in learning through online communities of practice. The innovation and value added lies in taking the scaleable lessons learned and applying them to emerging mobile technologies.

D. *Cellular Platform Infrastructure*

The core aim of the ComeIn project is a networked media platform facilitating real time broadcasting of video streams from webcams to mobile phones. This platform will facilitate the immediate transfer of multimedia information to the specific target groups. For this task the project includes VideoCells as partner who is a market leader in the field of telecom applications (see project participant's description below).

The platform will support an online community by developing the following features:

- Distributed File System (DFS) Infrastructure and Storage Management
- Video on demand (VOD) content
- Authorisations on VOD content and Dynamic Adaptation to the Client's Device
- Cluster Application Programming Interface (API) and Content Management

This means to research and develop a software platform that receives video from various sources and offer it to marginalised youth users with mobile handsets.

In order to support this capacity and in order to provide scalability and high availability, the platform will be developed as a Cluster (a group of servers that work together). The youth will use mobile handsets that support multimedia content to view the video of the system. Mobile devices with WAP and video streaming capabilities are required. Clients sign into the system with username and password. Any content in the platform can be either public or private with the list of authorised users.

The Video Cluster that will be researched and developed within the ComeIn project is a core technology for video services. VCcluster is VCELLS' cluster system dedicated to video services and will serve as the main platform for sending and receiving content to marginalised youth communities.

The Cluster will consist of two major layers – video and management:

- The video layer will receive the video from the various sources, transcode it, record it and distribute it to various destinations.
- The management will run a Video-Load-Balancing algorithm that will manage the resource usage of the Cluster servers efficiently.

E. *Video streaming*

Video content is "expensive" both with regard to the use of system resources and storage needs. Today when mobile operators wish to offer their customers video content, user generated or other, they need to purchase several different products and solutions, and then tailor them into one comprehensive platform. This demands additional costly development of software both for the services themselves and for provision of reports, billing and customer management services. The implications on marginalised youth are obvious – high costs of the device would eventually impose high costs on any inclusion programme involving advanced content streaming via mobile phones and on the individual.

In addition, since each part of such a system (the streaming server, the transcoding server etc.) works independently, there is a massive abuse of system resources, both within the work of the various components, and the surrounding infrastructure. The fact that VCcluster is a comprehensive platform allows operators to lower overall "tailoring" costs as each one of the components works as a cog-wheel within the overall management platform. The same "system architecture" allows continuous monitoring and managing of all system resources, so that they are only used when there is a specific request. This is also relevant to surrounding platforms and infrastructure, so that bandwidth is also used only when there is a real request.

Finally, V-CELLS patented algorithms and Data File System (DFS) capabilities allow operators to significantly lower the cost of storage.

F. User interface and user modelling

Based on the socio-scientific studies, ComeIn develops a user interface research that will be integrated in the architecture of the online community. User models will be defined and categorised to get the best match between the communities and user groups and the facilities provided in ComeIn. The user interface and the integration itself will be improved with the results out of the first iteration of the project evaluation.

Some main challenges are encountered when designing the user interface. ComeIn has to manage to design for a:

- diversity of users: accessibility becomes a main issue when taking into account users that can be different in age, capabilities, computer science skills, interaction styles, etc.
- diversity of services: user may need to access a variety of services. Furthermore the same services can be delivered through different means and with different features depending on the device, the users' preferences, etc.
- diversity of devices: different devices are used for different purposes, display of mobile devices are fairly small, contrast problems are often encountered, input mechanisms are different among devices and rather slow in general, connection can be unstable, etc.
- diversity of tasks: activities that encompass a variety of platforms, places and time, comprehend a set of tasks and subtasks that need to be defined and accomplished.

Specific user requirements for the user interface to the online mobile community will be taken from worked out results concerning content and infrastructure needs. Then those requirements will be combined with widely accepted guidelines for development of mobile services user interfaces. As a result, different user interfaces will be specified and prototyped for mobile devices and will build the basis for new services discovery for the architecture.

The main target is to define functional specifications that model the user profile by describing the user preferences, needs and interests. In order to implement the features of the user modelling, the user data model that supports the information storage in the system will be defined. Knowledge-based techniques will be applied so as to build an intelligent module which inputs are the user tracking and context-awareness components. Ontologies for the user profile description (like AccLip) will be used to develop the module. These actions aim to personalise the system according to each user. Finally user modelling will be implemented according to the module definition and technologies presented.

Another main goal is the specification, design and implementation of a user modelling architecture that provides personalisation capabilities to the system depending on the user. By defining a user data model the system is able to store information about users and allows them to configure a customised environment according to their preferences and needs. The user profile will allow the evaluation team

(Centre for Social Innovation - ZSI) to make assessment and evaluation about system users.

G. Evaluation and Assessment

The ComeIn project will evaluate the online mobile communities' tools and services as well as the technical infrastructure and user interfaces. It will design and run two pilots in two countries (UK and Austria) and will collect quantitative and qualitative data that will support the feedback input to provide to content, architecture and infrastructure. The expected impact on users' communities (especially young people) according to the technological trends influences social behaviour and the real cost/perceived investment that focus the attitude towards technological innovation of young people. Economic factors, social variables and market trends will be considered to define this aspect. The technical infrastructure and the user interfaces will be also considered in order to support the finalisation of ComeIn on the top of the state-of-the-art and in line with the social and technological trends that influence the target users. The evaluation activity will be carried out through the combination of three tasks: 1) Use cases/scenario design, 2) carrying out two pilots in real environment, and 3) collection and comparative analysis at European level. During the first phase, a comparative analysis on online cellular communities' tools and services will be carried out at the international level. Meanwhile a definition of the target users will be refined. On the basis of the above mentioned comparative analysis and target user definition, the respective partners will design one use case per country. Once conceived the use cases, each partner involved will produce a set of three scenarios (optimistic, real and pessimistic) analysing the potential impact of the project activities on target users. Collected data will support the development workings of the ComeIn project and will produce actual doable recommendation for further development both under a technological and social point of view.

H. Outcomes and Impact

As described above the ComeIn project follows several aims that will in combination lead to further insights in the field of marginalised youth and their use of ICT. The mobile online community set up by the project will have had experienced its first testing phase with at least two specific content packages and new adopted high technology which allows for real-time video streaming for tens of thousands of users at the same time will have been developed and implemented for testing.

Many of the expected theoretical results are already available: The socio-scientific analysis concerning marginalisation, digital divide and virtual communities as well as the first technical test results including Distributed File System and Video on Demand content. Challenge and answer videos for the two content packages (learn to learn and entrepreneurial skills) are already at hand. The main characteristics of the interface design, system specialities and features and the state of the art of user interface are available. Results and outcomes build the basis for the two pilot studies which will be carried out between December 2009 and March 2010.

The evaluation of the pilots will bring insight about acceptance and usability of the online platform and its features. It will show if the young marginalised people can be attracted by learning contents provided by mobile online communities. We will be able to describe if they accepted the offers and how they interacted on the platform. We will evaluate if the participation in joyful virtual learning environments will contribute to the willingness of young marginalised people to join informal or formal learning activities. Due to the experimental character of the pilot, longterm social impact cannot be predicted, but tendencies can be described.

Successive, the ComeIn project will assess, analyse and provide recommendations for future research in the field of mobile communities for the social inclusion of marginalised young people. It will identify and demonstrate items of RTD performed in ICT industries that require co-development with users and experts in social science (in processes of "open innovation").

The project will also contribute to an increase of competencies of social researchers to collaborate in technology development. Furthermore it will carry out questions and a roadmap for future research activities in the field.

V. THE COMEIN PARTICIPANTS

Atos Origin as coordinator is the Spanish branch of a major international IT services company, Atos Origin plc. Atos Research & Innovation, node of R&D at Atos Origin in Spain, is a point of reference in innovation for the whole Atos Origin group. It focuses on projects combining research & development and the economic exploitation of investigation's results. Within the Consulting and Public Sector business unit, the Atos Research and Innovation group (ARI) concentrates on the realisation of international projects, combining the most up-to-date technological developments with a high awareness of the human factors (education sciences, disability-related issues, cultural diversity, multi-linguality).

VideoCells (Israel) is a market leader in the field of telecom video applications. The company has developed a range of unique and affordable products to fulfil the needs of telecom operators and service providers. VideoCells is an innovative SME with a solid team of R&D experts specialising in video applications for cell telephony, as well as in providing cutting-edge technological solutions in the security and educational fields.

Inclusion Trust (UK) is an educational charity aiming to advance learning opportunities for people that are excluded, or disengaged, from traditional education systems. Through its flagship programme, Notschool.net Inclusion Trust provides re-engagement in learning for those 13–16 year olds who have no opportunities for learning through traditional routes.

The charity undertakes research into marginalised and excluded young people and publishes reports circulated to government ministers. Members of the trust sit on a number of advisory panels and prepare documents for government teams.

DramaWorks Development Services (Germany) is an advisor for authors and producers, particularly in questions concerned with developing, revising and presenting TV and motion picture projects aiming at constructive partnership. DramaWorks has also a relevant experience in the area of 'Mobile Content' which includes the development and adaptation of digital contents that are available via mobile devices anywhere and anytime. Recently, DramaWorks has developed the fictional series "Nina's World" as Mobile Content for the phone network provider O2.

The Centre for Social Innovation – ZSI – (Austria) is a private, not-for-profit research institute. Scientific qualifications and practical experiences encompass labour market, education and training, ethnic business, European research and technology development, technology assessment, environmental issues and cultural studies. Activities are concentrated on thematic priorities concerning the transformation to the Information Society and its knowledge base.

ZSI offers analyses and concepts for trend-setting social innovation. Topical research issues are the conditions of emerging technologies, the diffusion of technology and the results on society from such technology. Special emphasis is directed towards the inclusion of technology users.

The Styrian Association for Education and Economics (Austria) is a legal accredited institution for Lifelong Learning; main tasks are offers and projects at the interfaces between education and the world of work, Lifelong Guidance, Entrepreneurship Education, school development and adult education. In cooperation with the Federal Ministry for Education, Arts and Culture and the Federal Ministry for Economics and Labour STVG works in the field of vocational orientation, Lifelong Guidance, innovative approaches for entrepreneurial education and in the field of studies and research at the interfaces between education system and the world of work.

Fondazione IARD (Italy) is a non profit organization operating with private companies, universities, research centres and other non profit organisations, at national and international level, and with local and national public administrations. In the last 45 years, the institution has naturally evolved from a vocational training organisation to become an international non-profit centre for excellence in the fields of social research, cultural heritage promotion and higher training while maintaining its former vocation to support high skilled young people to improve their natural skills and get better access to the job market. Fondazione IARD operates in 3 main areas: Education and training; Field and documentary research on socio-economics science and humanities; and ICT Innovative Solutions.

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