Introducing social challenges to youth through gaming

Igor Perko
University of Maribor, Faculty of Economics and Business, Maribor, Slovenia
Igor.perko@um.si

Zoraida Mendiwelso-Bendek
University of Lincoln, Lincoln, UK
zbendek@lincoln.ac.uk

Abstract

Empowering of youngsters may contribute to their social responsibility, if correctly done. In this paper we report on research on the phenomena and characteristics of gaming and the challenges regarding inclusion of the young people in the society. We explore the posibilities to introduce gaming in moments of sociales chalenges and social transformation to the young individuals, and argue, which individual properties should we build upon, which issues can be introduced and what kind of gaming should be used to support the introduction.
To do this, we will examine the three involved fields: the gaming concepts and examples, the young individuals' characteristics, and the pressing social challenges. We will synthetize the research results to outline relations between social challenges, individual characteristics, and the gaming capabilities.
We identify the most important social challenges, reported in the literature, analyse the existing literature on the strengths and weaknesses of young people, and examine the measured gaming effects reported in the literature and proposed gaming concepts, appropriate for education.
In the synthesis, we use social and system dynamics to elaborate the relations between young people's issues, perceptions, expectations and also dreams of social challenges, transformations and gaming capacities and potential. The experience will support the games developers to design socially constructive games patterns and to develop trust in communication structures for empowering young people, using these tools. We will explore potentials for policy makers and practitioners to empower young people.
Keywords: Young people, Social challenges, Gaming, Competence building

1 Introduction

In this paper we point to the phenomena and characteristics of gaming and the challenges regarding inclusion of the young people in the society and developing their social responsibility understanding and behaviour. We explore the possibility to use gaming to introduce the social challenges to the young individuals, and if so, which individual properties should we build upon, which issues can be introduced and what kind of gaming could be used to support the introduction.
To do this, we examine the gaming concepts, the young individuals' characteristics, and the pressing social challenges. We synthetize the research results to outline relations between social challenges, individual characteristics, and the gaming capabilities.
The unresolved young people issues result in unemployment, and disengagement with the social transformation. In this paper we identify the most important social challenges, reported in the literature. (European_Commision, 2014, 2016a; European_Commission, 2012, 2015)
In the examination of the gaming social features we examine reports found in the literature. The gaming exploration will result with the list of current and potential games' capacities to

contribute in the gamer skills development. (Braun, Kornhuber, Lenz, & Cohort Study Subst Use, 2016; King, Kaptsis, Delfabbro, & Gradisar, 2016)
In the synthesis, we use social and system dynamics to elaborate the relations between young people characteristics, social challenges and gaming capacities. The results will be applicable for the games developers for creating socially constructive games properties, for policy makers and practitioners to properly include the games in the communication channels addressing young people, and for young people for successful skills and social competencies development.

2 State of the art research

Backgrounds on Gaming social implications are focused to discover evidenced opportunities as well as threats of the games for young people; additionally we present reports on methods or concepts of games design that could be used in the learning process. On the other hand the state of the art of young people in EU is presented. The reports on demography, education, employment, current and future work related competences, open issues, health, engagement, culture and ICT skills are presented.

2.1 The Young people current state

Young people (aged 19 to 25) in their European capabilities, activities and issues reflect the potentials, delivered by the society. Their inclusion in the society depends on the society's capacity to present them the viable solutions using the channels and communication models, they consider native.
There are multiple recent studies addressing the young people current state of affairs in EU (European_Commision, 2016a). To present a sufficiently complete picture, we are creating insights from multiple perspectives, to discover relevant young-people related topics in EU.

2.1.1 Demography

On 1 January 2014, almost 90 million young people aged between 15 and 29 years lived in the European Union. This presents around 18% of the total population, but has suffered a 7% decrease over the last three years (European_Commision, 2016b; Eurostat, 2014).
The steady decrease in the youth population living in the EU over the last decades has been subdued by the growth of immigration from non-EU countries. This phenomenon has occurred during the last two decades and has continued over most recent years (European_Commision, 2016b; Eurostat, 2014).

2.1.2 Education

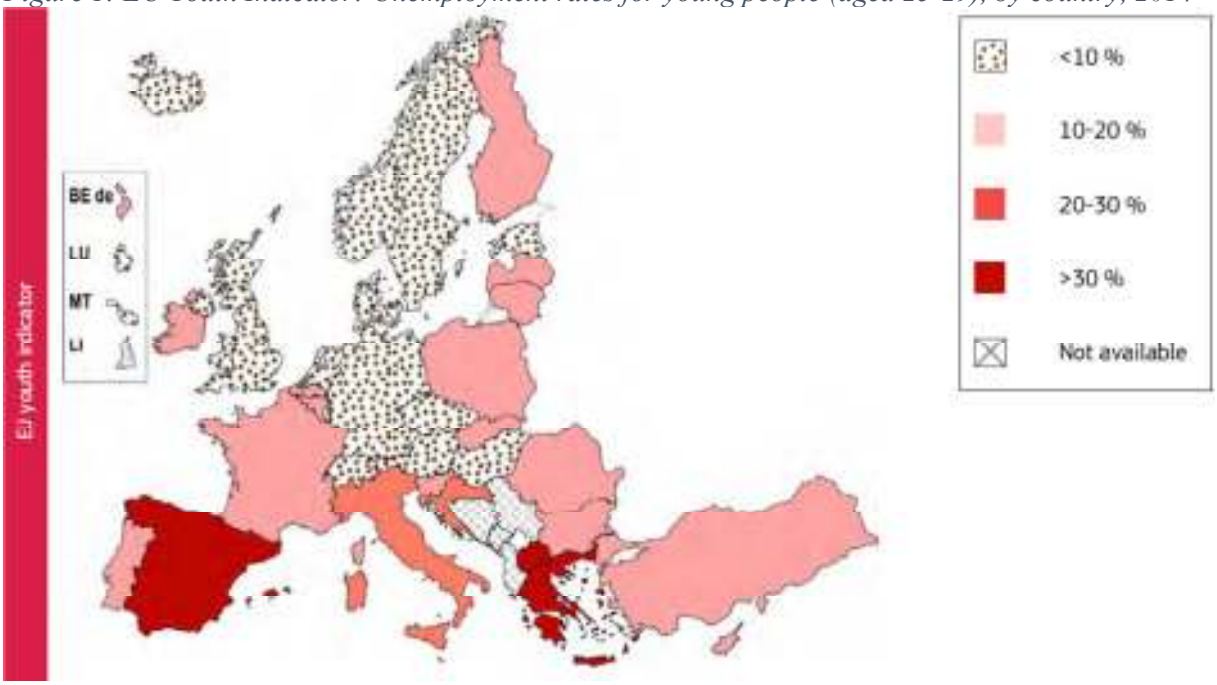
European children and young people on average spend more than 17 years in formal education, and this period has been increasing in recent years. Young people are also more highly-qualified than the older generations. In 2013 in the EU-28, 81.1 % of young people aged 20-24 had completed at least upper secondary education (European_Commision, 2016b; Eurostat, 2014).
Despite this positive trend in educational attainment, a significant share of young Europeans still face significant difficulties in the education system and feel compelled to leave prematurely without having gained relevant qualifications or a school certificate.
Among communication skills, the most important, enabling mobility, is using the foreign languages. The European Member States show particularly low proportions of young people learning at least two foreign languages, although in some countries the proportion is much higher, reaching 100 % or nearly 100% in the Czech Republic, Luxembourg, Romania, Slovenia, Slovakia, Finland and Lichtenstein.
Learning mobility is generally seen as contributing to the development of a wide range of skills and competences of young people. Most importantly, transversal skills such as language

competences, communication, problem-solving, and intercultural understanding are found to be improved by study periods abroad (European_Union, 2014). In the academic year 2012/13, 212 522 students participated in the Erasmus+ exchange programme (European_Union, 2014).

2.1.3 Employment

In 2014, more than 8.5 million young people aged 15-29 were unemployed (European_Commision, 2016b; Eurostat, 2014). The EU-28 unemployment rate among young people in 2014 was 26.3 % for those aged 15-19, 20.6 % for those aged 20-24 and 13.6 % for the oldest age group (25-29). The high level of unemployment recorded for the 25-29 age group shows an increasing difficulty in entering the labour market for young people, who have completed their education.

Figure 1: EU Youth Indicator: Unemployment rates for young people (aged 25-29), by country, 2014



As for the 25-29 age group, the unemployment rate exceeds 30 % in only three countries, Greece (40.8 %), Spain (30.3 %), and the Former Yugoslav Republic of Macedonia (39.3 %). For thirteen countries the unemployment rate is below 10 % (European_Commision, 2016b; Eurostat, 2014). Especially worrying is the rise of the number of the unemployable young people (aged 25-29), who have completed tertiary education between 2011 and 2014 (+12.9 %).

Young people are likely to be employed on a temporary contract or on a part-time basis. In 2014, nearly one in three 15- to 24-year olds in employment worked part-time. Part-time work of young people may imply apprenticeship either in the context of a vocational education programme or directly with an employer, combining work and studies, and to accommodate family needs. The majority of trainees (71 %) were not offered an employment contract when they finished their most recent traineeship (one of the temporary contract forms). (European_Commision, 2016b; Eurostat, 2014).

2.1.4 Work related competences and skills

In Table 1, the linkages between skills acquired in youth work, and the requirements of the labour market are presented. These sorts of skills and capabilities are often more highly valued than formal education qualifications.

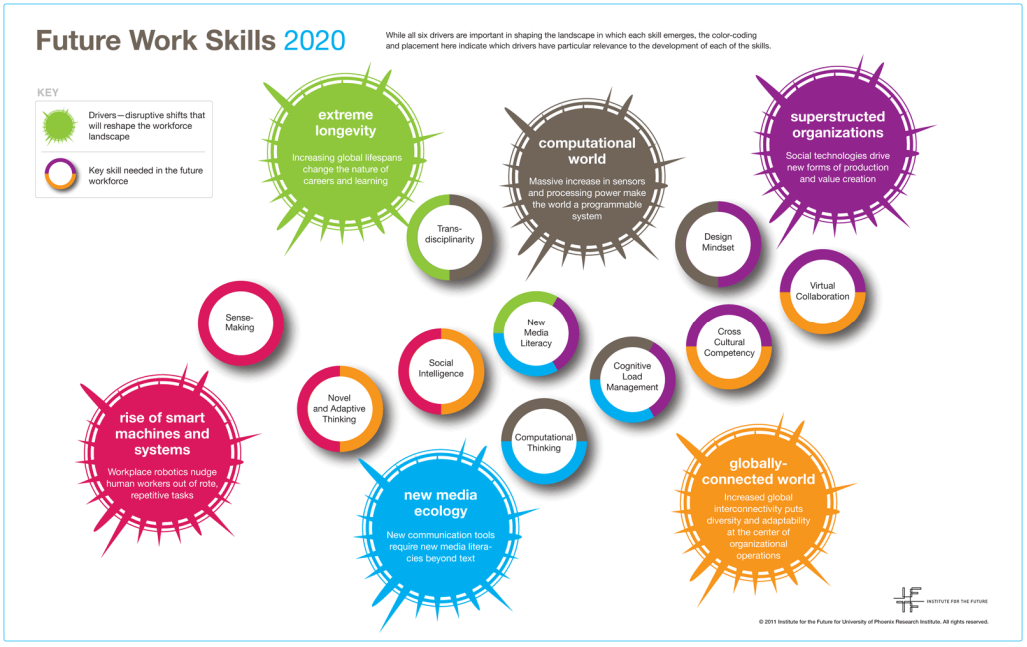
Table 1: Correspondence between skills in youth work and the labour market

Overarching skill categories	Outcomes identified in the research literature	Skills identified by employers
Personal (confidence and self-esteem)	• Increased confidence and self-esteem • Self-awareness (personal and social) • Readiness to take on new and more diverse experiences	• Adaptability and flexibility
Interpersonal (social and communication skills, teamwork, assertiveness)	• Improved teamwork • Increased communication • Improved pro-social behaviour • More open to people from diverse backgrounds • Positive peer relationships • Enhanced leadership	• Leadership • People management and teamwork • Influencing • Communication
Self-management skills (e.g. reliability)	• Motivation, commitment, resilience • Increased life skills	• Innovation and entrepreneurship
Competences in initiative and delivery (planning, problem solving, prioritising)	• Critical thinking skills • Planning, decision-making • Developed and focused career aspirations	• Change management • Project management • Decision making • Time management

(Bamber & group, 2012)

The currently recognised skills are projected in the future, where the drivers such as: information overflow, visualized through multimedia, smart devices, new forms of organisations and worldwide connectivity environment promote and require development of new skills, such as social intelligence, adaptive thinking, cross-cultural competencies, multimedia literacy, virtual collaboration and others, as depicted in Figure 3.

Figure 3: Future work skills



(The_Institute_for_the_Future, 2011)

2.1.5 Active citizenship related competences and skills

In Table 2, the connections between citizen learning process and the citizenship outcomes are presented. These skills and capabilities are essential for active involvement in EU environment.

Table 2 Aspects of active citizenship

Aspects of Active Citizenship	**Citizen learning processes: I feel able to…I know more about… I know how to...**	**Citizenship outcomes: Local, national, European and global dimensions**
Personal	• Value my own skills, knowledge and confidence • Know where to go to get what I need • Communication skills, negotiation skills, lobbying skills • Feel able to have a voice	• People identity and articulate their issues and problems • People take leadership roles in their community • People have the power and will to make choices in their life • People voice their concerns
Community relations	• Recognise that social exclusion is the responsibility of all • Understand how their behaviour affects others • Know the basis of inequality and how power operates • Understand more about people who are different to themselves • Feel more confident in asking	• Improved relations between diverse groups of people • Community projects are inclusive of people with different backgrounds • Increased points of contact between different communities • Increased networking between communities
Civil participation	• Understand how groups/networks work • Know how to encourage fair and democratic decision-making • Understand how to encourage support and develop volunteers • Know the importance of networking and delivering change • Chairing, meeting and facilitation skills • Negotiation and campaigning	• More civil society groups active in community-led service provision • Well-run democratic community groups • Increased informal community organising • Increased networking between community and voluntary groups • Effective representation in partnership and involvement with public bodies • Increased volunteering opportunities

Civic engagement	• Knowing how the external world operates • Understand my current democratic position and the opportunities for change • Understand the rules of engagement • Aware of range of opportunities for civic participation • Understand role of elected representatives and how to lobby them/ work with them • Know how public meetings work • Feel able to contribute and ask questions at a public forum • Recognise how to influence policy and practice at a European, national, regional or local level	• More people want to and feel capable of having a responsible role in formal democratic structures • More people play an active role on a community / neighbourhood level • Citizens work with public bodies to define and achieve common goals • Improved relations between citizens and statutory agencies • More people take part in dialogue with decision-makers • People lobby for change in the way forums and other structures operate • People campaign and petition

(Mendiwelso-Bendek et al., 2013)

2.1.6 Engagement

Young people's interest in the politics is declared by 33% of young people (EuropeanSocialSurvey, 2012). They tend to be active in non-governmental organisations and/or local organisations, which address local issues, rather than in political parties (European_Commision, 2015). Since young people use internet – especially mobile as a communication media, well prepared channels can support their active engagement, either to share their views, or to influence their activities in the environment. Mobile and social media can reach and help engage even the otherwise hard to reach young people.

Voluntary activities are reported by 25% of young people (FlashEurobarometer, 2014), especially if these are organised by families, schools, religious communities, sporting or other local organisations, that also provide them formal and informal recognition for their engagement (European_Commision, 2015). It seems that key drivers for young people to engage in a volunteer activity are: understanding of the activity goals and its role in the accomplishment, a group support to their activity, an invitation to join, expectance of a good organisation (also covering the expenses) and a recognition by people with reputation.

2.1.7 Culture

The engagement in traditional cultural activities, such as visiting museums, theatre or movie is declining (FlashEurobarometer, 2014). Two reasons are given: the lack of financial resources and the lack of interest. The lack of interest could be better explained by a shift of interest, where media devices have largely replaced on-site participation with content shifting from the traditional themes to instant entertainment.

2.1.8 ICT skills

The decrease in the use of desktop computers is compensated by the use of mobile technologies, providing access to advanced internet and cloud services. Mobile technologies are adapted by virtually entire young population and are redefining the concepts of communication, information processing, education, and entertainment for all, not only young population. The accessibility of mobile devices and services enables connections to the hard to reach individuals and provides a new means of equality.

2.2 The gaming

The games domain is reasonably well researched. The research ranges from purely technical to psychological ones. To better understand the effect games have on people, we scan the research results reporting on games effects on: Undesired behaviour, skills, social behaviour and learning. We finish our survey with the learning principles for successful learning games design.

2.2.1 Undesired behaviour

There are multiple analyses addressing the gamification's negative effects. The most attention is focused in examining the relations between aggression in the games and in the real life. Anderson and Bushman (2002) define and put under the test General Affective Aggression Model. Some of the claims argue against introducing first person aggressive games because of the risks of aggressive behaviour in the real life, as for instance "The evidence strongly suggests that exposure to violent video games is a causal risk factor for increased aggressive behaviour, aggressive cognition, and aggressive affect and for decreased empathy and prosocial behaviour.". Some other authors confirm the model (Gentile, Lynch, Linder, & Walsh, 2004) and provide mitigation strategies. But some newer research results downgrade the direct link between violent games and violent behaviour (Kneer, Elson, & Knapp, 2016). Argument are posted, that the effects are significant especially for individuals already prone to violent behaviour.

2.2.2 Skills

Gopher, Weil, and Bareket (1994) test the transfer of skills from a complex computer game to the flight performance and report significantly better performance for the pilots with gaming experience compared to the no-game group. Resultantly games are incorporated into the regular training program of the Air Force. A study on information processing skills examines the effects of playing domain unrelated games on the domain knowledge (Yuji, 1996). He displays no significant differences between the gamers and no-gamer groups in correct responses; however, returns of players were though significantly faster than those of non-players.

Adachi and Willoughby (2013) examine relationships between strategic video games, self-reported problem solving skills, and academic grades. In their longitudinal study they report that more strategic game play predicted higher self-reported problem in solving skills over time than less strategic game play. In addition, the results show support for an indirect association between strategic game play and academic grades. Romero, Usart, and Ott (2015) compare the new skills, required in the 21 century and serious games affect. They characterize the current need for 21st century skills and identify the corresponding core skills. They compare the skills with the most relevant game characteristics and suggest which functions should be upgraded.

2.2.3 Social behaviour

The questions why people play games arises. Hsu and Lu (2004) design and test a technology acceptance model for on-line games. They conclude, that about 80% of game playing can be explained with the social norms, attitude, and flow experience. Shin and Shin (2011) answer the same question for the Social network games. They suggest, that the user acceptance of SNG model explains the players' behaviour very well. Wang, Wang, Yin, and Xia (2012) research the reputation and cooperation in real life through Social Dilemma Games. They explore the evolution of cooperation using inferring reputation and present a viable method of understanding the cooperative behaviour in nature.

Trepte, Reinecke, and Juechems (2012) explore the social bonding that goes beyond the game. Their results show that online gaming may result in strong social ties, if gamers engage in online activities that continue beyond the game and extend these with offline activities. Authors notice the strong shift from direct human interactions to communication through devices.

2.2.4 Learning

de Freitas and Oliver (2006) explore the methods for evaluation of games impact on learning. They propose a four-dimensional framework for helping tutors to evaluate the potential of using games- and simulation-based learning in their practice, and to support more critical approaches to this form of games and simulations.

Tuzun, Yilmaz-Soylu, Karakus, Inal, and Kizilkaya (2009) research effects of computer games on primary school students' achievement and motivation in geography learning. According to their study students demonstrate statistically significant higher intrinsic motivation and statistically significant lower extrinsic learning motivation. In addition, students decreased focus on getting grades and were more independent while participating in the game-based activities. Their results make us reconsider the true value of learning: gaining grades or building up combinations of competencies.

Some authors find little or no links between games and learning scores; they question the relevancy of the current grading system. Liu and Chu (2010) analyse the effects of ubiquitous games in an English listening and speaking course and elaborated that incorporating ubiquitous games into the English learning process could achieve a better learning outcome and motivation than using non-gaming method. Yang (2012) explores digital games for developing students' problem solving and learning motivation. He reports that no statistically significant difference was found between the test groups. He also proposes the evaluation of other higher order elements of the cognitive domain in terms of academic achievement outcomes and skills, such as critical and creative thinking.

Avouris and Yiannoutsou (2012) provide a review of mobile location-based games for learning across physical and virtual spaces. They conclude that these kinds of playful activities can have an impact on learning, especially outside school, in local environment and visits in museums and other sites of cultural and historical value.

Mayer (2014) deals with the dilemma that games have potentials to improve motivation, but may distract from learning. He proposes an evidence-based approach that is grounded in cognitive theory to balance game features with instructional features. Kampf and Cuhadar (2015) elaborate the effects computer games have on learning about conflicts. The reflection changes on active conflicts are monitored before and after the playing a conflict related games. For some participants the reflections on conflicts in their environments changed, while all participants changed their attitudes about distant conflicts after playing games along these scenarios.

Hamari et al. (2016) explore the effect of challenging games on the learning results. They find that the challenge of the game has a positive effect on learning both directly and via the increased engagement. They suggest that the challenge of the game should keep up with the learners growing abilities.

(Gee, 2003) introduces 36 gaming principles, including Active, Critical Learning, Design appreciation, Semiotics, Metalevel Thinking, Risk decisions, Committed Learning, changing Identity, Self-Knowledge, Amplification of Input, intrinsic achievement, incremental, repetitive and ongoing Learning, Limited resources management, self-discovery, hypothesis probing, Multiple Routes, Text integration, Material Intelligence, knowledge transfer, Intuitive Knowledge, Cultural Models, Affinity Group cooperation, and a teacher principle. These principles, combined with the domain focus, have potentials to upgrade the individual understanding of the domain in much deeper sense than by standard learning process.

3 Issues and games opportunities comparison

Young people related issues are extrapolated and compared with the list of games social features. Even though the lists have distinct origins, they are highly correlated. Table 2.

Table 3 Young people related issues and games social features lists

Young people related issues	Games social features
Decrease in native young population	Skills development
Immigration from non-EU countries	Fast adaptation
Highly-qualified young people	Self-reported problems skills
Temporary contracts	Ubiquitous cooperative behaviour
Foreign languages	Building social ties
Learning mobility	Cooperation in virtual teams
Local and regional unemployment	High intrinsic motivations
Premature absence from the education system	Reduced extrinsic motivations and abstracts form learning
Inappropriate jobs	Building up combinations of competencies
Adaptability and flexibility	Disinterest in gaining grades
People management and teamwork	Metalevel, Critical and creative thinking
Innovation and entrepreneurship	Integration in local environment
Change and project management	Game design principles
Cross-cultural competencies	Risk decisions, Limited resources management
Mobile computers science	Incremental, repetitive, Committed and ongoing Learning, Active, Critical Learning
Multimedia literacy	Self-discovery and role identification
Virtual collaboration	Hypothesis probing and Multiple Routes examinations
Policies engagement	Text integration and Material Intelligence
Voluntary activities	Knowledge transfer and Intuitive Knowledge
Recognition of achievement	Cultural Models, Design appreciation
Culture affinity	Affinity Group cooperation
Civil participation and engagement	Teacher's role

4 Summary

In the paper two independent analyses are executed: the young people related issues and the games social features lists. Both of the analysis provide interesting results and provide an overview of the research fields. In the last part of the paper, the lists are set one next to another. The relations among young people issues and the games' social features are complex and are not determined in this paper.

Thereby, as in every game, we leave the reader with a challenge: determine three most important issues that affect you personally. For every issue find up to three games features, and send the authors of this paper the explanation of how can these features affect the selected issues and your own social responsibility understanding and activities.

5 References

Adachi, P. J. C., & Willoughby, T. (2013). More Than Just Fun and Games: The Longitudinal Relationships Between Strategic Video Games, Self-Reported Problem Solving Skills, and Academic Grades. *Journal of Youth and Adolescence, 42*(7), 1041-1052. doi: 10.1007/s10964-013-9913-9

Anderson, C. A., & Bushman, B. J. (2002). Human aggression. *Annual Review of Psychology, 53*, 27-51. doi: 10.1146/annurev.psych.53.100901.135231

Avouris, N., & Yiannoutsou, N. (2012). A Review of Mobile Location-based Games for Learning across Physical and Virtual Spaces. *Journal of Universal Computer Science, 18*(15), 2120-2142.

Bamber, John, & group, Expert. (2012). Developing the creative and innovative potential of young people through non-formal learning in ways that are relevant to employability. http://ec.europa.eu/youth/library/reports/creative-potential_en.pdf

Braun, B., Kornhuber, J., Lenz, B., & Cohort Study Subst Use, Risk. (2016). Gaming and Religion: The Impact of Spirituality and Denomination. *Journal of Religion & Health, 55*(4), 1464-1471. doi: 10.1007/s10943-015-0152-0

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), 249-264. doi: 10.1016/j.compendu.2005.11.007

European_Commision. (2014). Digital Agenda Europe. http://ec.europa.eu/digital-agenda/digital-agenda-europe

European_Commision. (2015). Special Eurobarometer 429: Attitudes of Europeans towards tobacco and electronic cigarettes. http://ec.europa.eu/public_opinion/archives/ebs/ebs_429_en.pdf

European_Commision. (2016a). EU youth document library. 20016, from http://ec.europa.eu/youth/library/index_en.htm

European_Commision. (2016b). *EU youth report 2015* Retrieved from http://ec.europa.eu/youth/library/reports/youth-report-2015_en.pdf

European_Commission. (2012). Excellence in public administration for competitiveness in EU Member States. http://ec.europa.eu/

European_Commission. (2015). Find-er. Retrieved 2016, from http://ec-europa-finder.hosted.exlibrisgroup.com/

European_Union. (2014). *Erasmus Impact Study: Effects of mobility on the skills and employability of students and the internationalisation of higher education institutions.* Retrieved from http://ec.europa.eu/dgs/education_culture/repository/education/library/study/2014/erasmus-impact_en.pdf

EuropeanSocialSurvey. (2012). Europeans' Understandings and Evaluations of Democracy. http://www.europeansocialsurvey.org/

Eurostat. (2014). *Youth (yth)*. Retrieved from: http://ec.europa.eu/eurostat/web/youth/data/database

FlashEurobarometer. (2014). European Youth. http://ec.europa.eu/public_opinion/flash/fl_408_en.pdf

Gee, J. P. (2003). *What Video Games Have to Teach Us About Learning and Literacy*. Basingstoke: Palgrave.

Gentile, D. A., Lynch, P. J., Linder, J. R., & Walsh, D. A. (2004). The effects of violent video game habits on adolescent hostility, aggressive behaviors, and school performance. *Journal of Adolescence, 27*(1), 5-22. doi: 10.1016/j.adolescence.2003.10.002

Gopher, D., Weil, M., & Bareket, T. (1994). TRANSFER OF SKILL FROM A COMPUTER GAME TRAINER TO FLIGHT. *Human Factors, 36*(3), 387-405.

Hamari, J., Shernoff, D. J., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2016). Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior, 54*, 170-179. doi: 10.1016/j.chb.2015.07.045

Hsu, C. L., & Lu, H. P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information & Management, 41*(7), 853-868. doi: 10.1016/j.im.2003.08.014

Kampf, R., & Cuhadar, E. (2015). Do computer games enhance learning about conflicts? A cross-national inquiry into proximate and distant scenarios in Global Conflicts. *Computers in Human Behavior, 52*, 541-549. doi: 10.1016/j.chb.2014.08.008

King, D. L., Kaptsis, D., Delfabbro, P. H., & Gradisar, M. (2016). Craving for internet games? Withdrawal symptoms from an 84-h abstinence from Massively Multiplayer Online gaming. *Computers in Human Behavior, 62*, 488-494. doi: 10.1016/j.chb.2016.04.020

Kneer, J., Elson, M., & Knapp, F. (2016). Fight fire with rainbows: The effects of displayed violence, difficulty, and performance in digital games on affect, aggression, and physiological arousal. *Computers in Human Behavior, 54*, 142-148. doi: 10.1016/j.chb.2015.07.034

Liu, T. Y., & Chu, Y. L. (2010). Using ubiquitous games in an English listening and speaking course: Impact on learning outcomes and motivation. *Computers & Education, 55*(2), 630-643. doi: 10.1016/j.compedu.2010.02.023

Mayer, R. E. (2014). *Computer Games for Learning: An Evidence-Based Approach*. Cambridge: Mit Press.

Mendiwelso-Bendek, Zoraida, Recknagel, Gabi, Hartley, Ted, Rooke, Alison, Mayo, Marj, Packham, Carol, & Milburn, Karen. (2013). TAKE PART UK Learning Framework http://takepartresearchcluster.blogs.lincoln.ac.uk/files/2013/07/13946_Take-part-learning-framework-final-2011.pdf

Romero, M., Usart, M., & Ott, M. (2015). Can Serious Games Contribute to Developing and Sustaining 21st Century Skills? *Games and Culture, 10*(2), 148-177. doi: 10.1177/1555412014548919

Shin, D. H., & Shin, Y. J. (2011). Why do people play social network games? *Computers in Human Behavior, 27*(2), 852-861. doi: 10.1016/j.chb.2010.11.010

The_Institute_for_the_Future. (2011). Future work skils. http://www.iftf.org/uploads/media/SR-1382A_UPRI_future_work_skills_sm.pdf

Trepte, S., Reinecke, L., & Juechems, K. (2012). The social side of gaming: How playing online computer games creates online and offline social support. *Computers in Human Behavior, 28*(3), 832-839. doi: 10.1016/j.chb.2011.12.003

Tuzun, H., Yilmaz-Soylu, M., Karakus, T., Inal, Y., & Kizilkaya, G. (2009). The effects of computer games on primary school students' achievement and motivation in geography learning. *Computers & Education, 52*(1), 68-77. doi: 10.1016/j.compedu.2008.06.008

Wang, Z., Wang, L., Yin, Z. Y., & Xia, C. Y. (2012). Inferring Reputation Promotes the Evolution of Cooperation in Spatial Social Dilemma Games. *Plos One, 7*(7). doi: 10.1371/journal.pone.0040218

Yang, Y. T. C. (2012). Building virtual cities, inspiring intelligent citizens: Digital games for developing students' problem solving and learning motivation. *Computers & Education, 59*(2), 365-377. doi: 10.1016/j.compedu.2012.01.012