An Analysis of Serious Games for Global Education in the EFL Classroom

Introduction

The availability of technological resources for language learning produced discussions as to which tools are most effective for what learning purpose. Indubitably, new media need to be implemented in the language classroom. This necessity is based on two reasons: the exposure of students to media, as well as the meaningful and reflective handling thereof: "With the proliferation of digital media, including its ease of use and ease of access, the kind of literacy needed goes beyond reading and writing to incorporate use and manipulation of graphics, sound and video, as well as how and when they are combined in different ways" (Godwin-Jones 2016, 5). Digital games have attracted increased attention as their inherent multimodality allows players different accesses to meaning and representation and thus fosters learning through a variety of channels. Assuming that "meanings are made […] through many representations and communicational resources, of which language is but one" (Jewitt 2008, 246), the use of digital games for language learning purposes amounts to situated learning "across image, gesture, gaze, body posture, sound, music, speech, and so on. From a multimodal perspective, image, action, and so forth are referred to as modes, as organized sets of semiotic resources for meaning making" (ibid.). One of the most applicable digital game types for language learning purposes are serious games. Serious gameplay is considered to be advantageous to learning due to a genuinely built-in curriculum that blends serious content into a virtual game world, which makes serious games a new genre within the digital game industry (cf. Ratan et al. 2009, 10). Since the purpose of gameplay therefore is not only entertainment, Sara de Freitas defines serious games as "applications using the characteristics of video and computer games to create engaging and immersive learning experiences for delivering specified learning goals, outcomes and experiences" (de Freitas 2006 in Guillén-Nieto et al. 2012, 436). In terms of topics, serious games cover complex social issues of global concern, such as immigration, climate change or poverty: "The term 'serious game' refers to a wide range of simulations and games that attempt to address important societal issues, such as world hunger, homelessness, and national catastrophe" (Sanford et al. 2015, 91), and therefore comprises topics relevant to the paradigm of global education. Understood as a holistic paradigm of education, global education considers the topicality of global complexities and interconnectedness with respect to enabling students to cope with these challenges. Global education describes standards for becoming knowledgeable and competent global citizens, suggesting central competences, topics, and methods for such an education. Thus, the question which needs to be answered is to what extent the different representations of content in a serious game contribute to meaning making for the player, which triggers the development of competences relevant to global education.
Considering and analyzing computer games for their effect on players is nothing new, especially the analysis of possible negative effects of ego-shooter games on their players, which gained attention with the rise of computer games such as Counterstrike or World of Warcraft. It was not until about 10 years ago that positive impact was considered: "[…] the positive and beneficial aspects of playing have become a major topic of game research in recent years. It is argued that computer games are a constructive tool to foster learning" (Mitgutsch 2012, 572). Growing interest in game-based learning can be attributed to two developments: firstly, a change in learning approaches focusing on a student-oriented learning environment, including designing classroom scenarios that allow situated and experiential learning, which digital games seem to offer. Secondly, the rapid advancement of games, as well as the spread of gamification across society leading to larger acknowledgement across research disciplines. The JIM study, an annual study conducted by the Medienpädagogischer Forschungsverbund Südwest, which surveys the information and media behavior of German teenagers, reveals that 68% of 12-19-year-old German teenagers play digital games on a daily basis for up to two hours a day. While digital game-based learning (DGBL) arose from researching the influence of commercial entertainment games, it was the Serious Games Initiative, founded in 2002 at the Woodrow Wilson Centre for International Scholars in Washington D.C., which helped to promote research with regard to educational games and their impact on learning (Guillén-Nieto et al. 2012, 436). In Marc Prensky’s seminal book Digital Game-Based Learning, DGBL is defined as “any marriage of educational content and computer games” (2001, 145). In recent years, the effect of serious games on learning has been analyzed extensively. The research group around Thomas Connolly analyzed 129 papers that provided empirical evidence referring to digital games, including entertainment games, games for learning and serious games. Out of 129 studies evaluated, 12 studies focused on the learning outcomes of serious games. Two of those 12 studies described affective and motivational outcomes, two others analyzed behavior change, two tracked positive motor skill outcomes, three studies tested knowledge acquisition and content understanding, and three more highlighted the social/soft skill outcomes for the players when using serious games (cf. Connolly et al. 2012, 669). A study that highlights the effects of multimodality on learning was conducted by Ute Ritterfeld et al. They claim that “the higher degree of multimodality affords additional channels for information delivery and presentation, which facilitates the sense-making process in learning” (Ritterfeld et al. 2009, 691-692). It can also be shown that “multimodality has a positive impact on educational outcomes […] most visible in the objective measures of knowledge gain” (ibid., 694). Based on these encouraging results, the scholars recommend further studies in order to gain more detailed information concerning the most effective implementation of the games (cf. ibid., 696).

Multimodality and Serious Games

Serious games combine two dimensions of classification: gameplay and serious purpose. Thus, the structure of the games and the way they are played show the same characteristics as entertainment games. As computer games, they can be seen as "texts in the broadest sense of this term: they are cultural objects which both reflect and
produce the meaning and ideologies of the settings in which they are produced and received" (Beavis et al. 2009, 169). Similar to other digital games, serious games consist of a mission which needs to be achieved with the help of one or more avatars. The challenges the players are faced with lead to the development of a story, also referred to as the narrative of the game. Since the development of the story depends on interaction with the game, this interaction can also be considered an element in the making of meaning: "Plato in the Phaedrus famously complained that books were passive in the sense that you cannot get them to talk back to you in real dialogue the way a person can in a face-to-face encounter. Games do talk back. In fact, nothing happens until a player acts and makes decisions" (Gee 2005, 34). Manipulating the fate of the avatar through game interaction can then also lead to an identification with the avatar. Multimodal aspects, such as manoeuvring the avatar through the virtual environment, seeing its reactions such as body posture, facial expressions, and quasi-human emotions and experiences can add to the player's understanding of the content. Being digital games, serious games also provide the learners with audiovisual modes, such as the video character of the game and sound support, and can thus appeal to different language learner types. Common additional features, such as icons, bar charts or different color schemes support understanding, provide information, and reflect moods. It is the player's task to decode the combination of different modes and their influence on the content in order to make correct decisions to attain the mission or goal of the game. Wrong decisions and misinterpreting signs lead to failure. Hence, similar to multimodal novels, serious games also foster multiple literacies necessitating reading of modes and integrating them into the larger picture of the game (cf. Hallet 2014, 8).

**Serious Games and Global Education**

The concept of global education emerged in the mid-1970s in the United States. Scholars such as James M. Becker called for global education in order to help individuals see themselves as participants of a global system (cf. Kirkwood-Tucker 2009, 7). After the UN Earth Summit in Rio de Janeiro in 1992, necessary actions for global education were acknowledged by the participating member states and objectives substantiated. Despite the fact that global education highlights the ramifications of a globalized world, its educational idea does not imply a globalization of education, but needs to be understood as national efforts realizing structures that are globally oriented (cf. Lütge 2015, 8). David Selby provided one of the most commonly quoted definitions of global education in 2000:

Global education is a holistic paradigm of education predicated upon the interconnectedness of communities, lands, and peoples, the interconnectedness of all social, cultural and natural phenomena, links between past, present and future, and the complementary nature of the cognitive, affective, physical and spiritual dimensions of the human being. It addresses issues of development, equity, peace, social and environmental justice, and environmental sustainability. It encompasses the personal, the local, the national and the planetary. Congruent with its precepts and principles, its pedagogy is experiential, interactive, children-centered, democratic, convivial, participatory, and change-oriented. (Selby 2000, 2)
In 2005, the United Nations General Assembly declared a Decade of Education for Sustainable Development (DESD), urging member states to "contribute to enabling citizens to face the challenges of the present and future and leaders to make relevant decisions for a viable world" (UNESCO 2005, 4). The DESD also led to efforts to implement global education in Germany. In 2007, the Kultusministerkonferenz (KMK) and the German Federal Ministry of Economic Cooperation and Development (BMZ), published the first edition of Orientierungsrahmen für den Lernbereich Globale Entwicklung encompassing the subjects Geography, Biology, Political Education and Applied Ethics. In 2016, an updated and edited version was released including suggestions for Foreign Languages. The framework states:

Global development education/ESD gives students orientation in an increasingly globalised world, which they can build upon in the course of lifelong learning. Following the guiding principle of sustainable development, it aims at developing basic competencies
- for shaping one's personal and professional life,
- for actively involving in the transformation of society,
- and for accepting shared responsibility on a global level. (Schreiber 2016, 86)

The framework classifies three dimensions of competences crucial to global education, which are "Recognising," "Assessing," "Acting" (Schreiber 2016, 91). "Recognising" refers to the notion of knowing and understanding, "Assessing" takes aim at students' ability to judge and reflect, and "Acting" entails the notion of participating and acting in a meaningful way contributive to solving global issues.

![Fig. 1: Core competences as specified in the curriculum framework Education for Sustainable Development published by the KMK/BMZ (Schreiber 2016, 95)](image-url)

Anglistik, Volume 29 (2018), Issue 1
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It is especially the implementation of complex tasks\(^1\) that makes task-based language learning notably useful for global education scenarios. The approach of task-based language learning focuses on using contextualized, meaningful and outcome-oriented exercises in which students use authentic language. Serious games can be seen as task-based learning environments and can contribute to global education on a content level by employing global issues. In accordance with David Selby's definition of global education, serious games involve players in an interactive, participatory, experiential and change-oriented environment. Particularly the exposure to an authentic language environment, in which students practice their communicative skills in a safe environment, turns serious games into suitable tools for the EFL classroom. Additionally, serious games allow players to experiment with different characters in different intercultural settings, which can enhance practicing the mechanics of intercultural encounters in a safe environment without having to fear consequences in the real world. Furthermore, the communicative aspect is inherently incorporated in serious games by exposing the students to a linguistically challenging activity. The aspect of situated meaning is especially relevant for foreign language learners, as "games always situate the meanings of words in terms of the actions, images, and dialogues they relate to, and show how they vary across different actions, images and dialogues. They don't just offer words for words" (Gee 2005, 36).

**Examples for EFL Teaching Contexts**

Over the last two decades, the quantity and quality of educational games has increased considerably, leading to a "favorable climate for the use of digital games for teaching, learning and training" (Darvazi 2016, 3). Yet, one should not ignore the differences among them. Paul Davarsi notes that "research and implementation of digital games for education are still in early stages, and much work remains to better grasp how their potential can be harnessed to produce and assess learning outcomes" (3). It was part of my research project to analyze four different serious games for their potential of facilitating the development of competences relevant to global education for EFL learners. Thematically, the games chosen focused on the global issue of human rights violations. Using a serious game as a source for dealing with a complex global issue in an EFL classroom presents a timely form of reading and meaning-making. Incorporating this new form of media into the EFL classroom contributes to enriching available means of signification and a new literate tradition (cf. Hull and Nelson 2005, 226). Especially through the interaction with an avatar, the games allow for an emotional experience, complementing the range of means of communication in the EFL classroom. In addition, the games transform a complex topic into a playful experience by offering positive reward feedback and an overall positive goal, but retain their educational momentum by using texts, images, sounds that thoughtfully convey the topic. Thus, through the combination of the games' interactivity, their serious

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\(^1\) Wolfgang Hallet states that complex tasks are "Lernarrangements und Aufgaben für den Englischunterricht, die 'Kompetenz' in einem komplexen Sinn – also fremdsprachige Diskursfähigkeit – entwickeln und fördern sollen […] Zu ihrer Bewältigung müssen die Schülerinnen und Schüler problemlosende Strategien sowie kognitive, sozial-interaktionale und diskursive Fähigkeiten anwenden und (weiter-) entwickeln – und dies alles in der Fremdsprache" (Hallet 2012, 10-11).
message and their multimodal features, they facilitate a learning experience through reading the game, interacting with the avatar and attaining the goal of the game.

Three of the games used for the study, *ICED – I Can End Deportation* (Breakthrough Entertainment, www.breakthrough.tv), *Mission US 2: A Flight to Freedom* (WNET Productions, wnet.org), and *Against All Odds* (UNHCR, www.playagainstallodds.ca) were curated on the website www.gamesforchange.org; one of the games, *The Underground Railroad* (The National Geographic Center for Geo-Education) was taken from the National Geographic website (http://www.nationalgeographic.org/education/underground-railroad-journey-freedom). Three out of four games are online games (*ICED* can be downloaded and run without an internet connection), free of cost, and require minimal additional resources (e.g., Sandstone Player), which makes them easy to use in classrooms. However, the games do not run on mobile devices, but need to be played on a desktop computer. Thematically, they focus on the topic of escape and flight. The global issue highlighted in the games is the violation of human rights, while the games are played from the perspective of a refugee or immigrant avatar. In *ICED*, players can choose between five different avatars who entered the United States as undocumented immigrants, have lived there for many years, and might be faced with deportation if they violate their migrant status. The player learns that fighting off deportation is quite difficult, if not impossible. The game exposes unfair treatment of undocumented immigrants, leading to deportation in four out of five cases for the avatars. While *ICED* is set in the 21st century, the game *A Flight to Freedom* focuses on a historical perspective and is set in Kentucky in 1848. The game is played from the point of view of a fugitive slave called Lucy and centres around her struggles to flee from the farm where she works as a slave. Similarly, the game *The Underground Railroad* focuses on the flight of two young slaves into northern states in 1852. While *The Underground Railroad* game leads to a successful escape, Lucy is captured and brought back to the farm. The reason why *The Underground Railroad* leads to a successful outcome is the game's focus on the efforts of abolitionists, such as Harriet Tubman or Frederick Douglas, whose roles are highlighted in the game. *Against All Odds* is set in the 2000s, played from the perspective of a refugee fleeing a war zone country: "In *Against All Odds*, students follow a young person's flight from oppression in his or her home country to exile in an asylum country. The game is intended to increase students' awareness and knowledge about refugees – where they come from, what situations they have faced and how they adapt to their new lives"2. In all games, the spoken and written text is presented in English with no option of switching to German, nor an option of enabling a German dictionary. The text load varies, with most of the texts being quizzes that need to be answered by the player or instructions that need to be followed. All games contain a listening feature accompanying the texts presented. Understanding the content is supported by additional explanations, icons or maps that indicate where the avatar is going, facilitating the development of declarative knowledge. By making decisions for their avatars, the players can practice their problem-solving and decision-making skills. The players advance to the next steps in the game by answering quizzes which help them to experience the consequences of their actions. The individual controlling of the avatar and

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its survival can support affective skills by creating empathy for the virtual character the player is responsible for.

Against the backdrop of these considerations it becomes clear that the multimodality of games resulting from their audiovisual output, icons, reactions from the avatar, and their use of haptics comprises integral functions of a serious game that can support the development of skills relevant to global education. The following figure shows the connection of the characteristics of the games to the competences relevant to global education. Agential competence is elicited through the game features of interactivity and the simulated quasi-authentic environment. By being actively involved in resolving game-inherent tasks and making moral decisions, players practice their acting skills. Moreover, from the engagement with an avatar and biographies of the avatars evolves the students' understanding of the content and of the avatar, both of which are part of assessing competence. Furthermore, the explanations and immediate feedback help the players to reflect critically on their actions. Conducive to recognition competence, the facts presented as well as the embedded information contribute to the acquisition and understanding of topical information on a global issue. Since debriefing discussions should be in the target language, the games can also be regarded as a catalyst for applying communicative skills and engaging students in using the target language.

**Fig. 2: Skills triggered by game characteristics**

<table>
<thead>
<tr>
<th>Recognising</th>
<th>Assessing</th>
<th>Acting</th>
<th>Communicating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>Avatar</td>
<td>Interactivity</td>
<td>Target language environment</td>
</tr>
<tr>
<td>Immediacy</td>
<td>Feedback</td>
<td>Simulated Environment</td>
<td>Debriefing / Reflection</td>
</tr>
<tr>
<td>Story</td>
<td>Authenticity</td>
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**Fig. 3: Contribution of serious games to competences relevant for global education and the EFL classroom**

**ICED – I Can End Deportation**

The choice of ICED to teach EFL learners about human rights violations is based on the game's contribution to harness the complexity of the topic through its multimodality and interactivity. The incorporation of written text, images, the different avatars, and voice-over in an interactive virtual environment allows a playful access to the topic. ICED teaches players about current immigration laws on detention and deportation and the violation of human rights. It is the purpose of playing ICED to evaluate and critically reflect on human rights violations and to assess possibilities to enforce and respect human rights outside of the game. Therefore, it is not only important to further students'
reflection of human rights violations as part of the game, but also to consider the game as a simulation of real life. The presentation of characters/avatars at the beginning of the game enables players to develop a closer connection to the avatars, particularly since the avatars are presented with a seemingly authentic biography (see image 1). Despite the vague setting, the avatar can be manoeuvred through streets alongside stores, factory buildings and railroad tracks. In order to succeed in the game, and gain a Green Card, the player needs to collect civic points and light bulbs. The light bulbs stand for quizzes that need to be answered correctly (see image 2). Answering a question incorrectly causes the appearance of police officers who chase the avatar and can eventually lead to detention. Yet, the difficulty of escaping detention does not just lie in answering quizzes correctly, but also in avoiding ICED officers who appear and chase the avatar faster and faster without any apparent reason as the game continues.
From a content perspective, using ICED in an EFL classroom can bridge the gap between teaching issues of U.S. citizenship and socio-cultural and political elements specific to the U.S.; it can also open up the question of human rights for immigrants. With the help of informative texts and artifacts specific to the U.S. (e.g. the Green Card), the setting generates an easily interpretable image of immigrants in the U.S. The visualization of police officer hats helps the players to understand the severity of the situation – in case questions are not answered correctly or not enough points are collected, they automatically are closer to deportation. The situation worsens for the avatar as soon as the player makes progress (traceable on the progress bar), while at the same time the risk of being deported rises when questions are answered incorrectly or the number of points collected is insufficient.

**Findings from the Empirical Study**

In order to assess the potential of serious games for the development of global education competences, I conducted a research study in which one of the games tested was ICED. The overall project consisted of two parts: a blended learning school study and a small group study conducted at the TU Braunschweig. 104 10th-graders and five EFL teachers participated in the school study, six students participated in the small group study. The results of the school study were collected in questionnaires, group discussions, game logs, and teacher interviews. The results of the small group study were gathered by questionnaires. ICED was used in the blended learning unit, the other three games were part of the small group study. The blended learning unit comprised nine lessons of 45 minutes of which two lessons were used as pre-gaming sessions, four lessons were used for the gameplay, and three lessons were used as post-gaming project work. The evaluations showed that all games contributed to the players’ development of global education competences. However, some outcomes were more significant than others. The interactivity of the game and the need to take responsibility for the development of the story led to the most solid learning outcomes. The majority of the students confirmed that the self-efficacy facilitated in the games challenged their cognitive skills best. The students stated that being in charge of their learning, triggered by the constructivist learning environment, led to a better retention of the content, as well as a higher involvement with the content, e.g. by answering quizzes and making decisions. Furthermore, the avatar and its proximity to the self led to an increase in understanding and afforded a change of perspective. One of the ICED icons represented by a police hat led to an especially good understanding of the game: The students confirmed that the more police hats were added to the game, signifying an increased threat of being deported, the more their thrill and fear increased. Students emphasized that identification with the character intensified especially because of the feeling of being haunted and having to make quick decisions for their avatar. In addition to creating identification, empathy for the avatar also facilitated a deeper learning experience and immersion into the context, which is crucial for a more sustained engagement with the task. Similar to the police hats, the voice-over feature added to the dire atmosphere. The listening feature was enabled by students who prefer listening support for their tasks, and disabled by others. The students who used the listening add-on emphasized an increase in their understanding of the
game, especially through the voice of the reader. While, according to the students, the voice sounded "cool" on the one hand, it was also threatening to them on the other, impacting the way they perceived the gaming situation. The voice-over was described as an impressive and authentic sound, adding to the overall perceived authenticity of the game, enabling a better retention of the context afterwards. Furthermore, the results from the small group study underscored that additional vocabulary support, provided in Mission US 2: A Flight to Freedom through a game feature called 'smart-words,' increased the players' comprehension of unknown words. While the majority of students verified that the development of meaning of unknown words was easy for them with the help of the images and comprehensible plot of the game, the additional glossary in one of the games tested helped them with more precise meaning-making. The results, which were collected with the help of a quantifiable assessment sheet evaluating players' impressions and experiences, indicated that the game with the lowest assessment rate was Against All Odds; it was the game with the fewest additional multimodal features, such as icons, audio features or inherent vocabulary scaffolds. Students appreciated the more vivid visuals in Underground Railroad and would have liked to play a more modern game than ICED for the blended learning unit, but also stated that a more multimodally complex game might distract from learning. This goes hand in hand with their assessment of the text passages and icons presented. Some students complained about the length of the text as too long, as well as about having to monitor too many different icons simultaneously. On the other hand, the students highlighted the features that contributed to achieving the goal of the game and that transported the depressing mood, implicitly stressing the multimodal contribution to achieving the games' goals and to understanding their content. These findings yield the result that students liked the games that allowed individualized settings for players, such as turning auditory features on and off, allowing additional vocabulary help, choosing a customized avatar and purposeful icons. Particularly the visual, auditory and kinaesthetic modalities furthered students' understanding of the games, namely the authentic gaming environment, the atmosphere-enhancing voice-overs, the icons that symbolize a clear goal-orientation, short text explanations as feedback to the quizzes and the avatar's agility. Students were well aware of the fact that these games were played for a learning purpose and were eager to achieve the games' goals. Therefore, additional features that served a more attractive design or entertainment purposes were considered appealing to the eye, but unnecessary in order to fulfil the game's mission. In line with that, students claimed they would not play these games as pastime activities, but strongly approved of their use in the EFL classroom. Additionally, the results present the games' impact on students' development of literacy expressed in positive comments on the mobility of the avatar and on getting immediate feedback and thus learning through making mistakes with the avatar. Since, according to Kurt Squire, game literacy "can be defined as developing expertise in designing rewarding experiences for oneself with a game world (particularly within the game's semiotic and rule system)" (Squire 2008, 644), the positive evaluation of mistakes and of learning through problem-solving on the way to the game's goal hinted at the students' development of game literacy.
Conclusion

All in all, the most significant result of the empirical study showed an increase in students' engagement in tasks and strong participation in the solving of issues posed to them in the simulated world. It was the interactivity of the game in particular and thus the opportunity of making their own decisions which immersed the students in the virtual world and captured their attention over the gaming period. The deep learning experience also yielded positive learning outcomes for the students' cognitive, procedural and affective skills. The findings support ongoing trends in learning practices, which highlight the students' active participation as essential for better learning outcomes (cf. Thomas 2012, 18). Moreover, the results showed that the different icons, the possibility of playing from the perspective of an avatar and the different text formats presented facilitated a better understanding for the students. In addition, the listening feature afforded language authenticity of the setting and served as an additional language scaffolding for some of the students. The study participants approved of the blending of familiar text forms, namely the written text and listening features, with the game-inherent kinaesthetic-tactile mode. However, the assessment of the four games also showed that in view of the growing trend of global collaboration, students lamented the lack of features supporting students' communicative productivity, such as chats. While students were asked to play the game on their own, interaction and exchange between students was highly encouraged and certainly increased students' involvement with the content; a chat feature, for example, could document students' language learning progress. Thus, despite some of the weaknesses of the serious games assessed for this study, their advantages for socio-emotional learning, the integrated learning experience, and their promotion of self-efficacy demonstrated the strong potential to further competences relevant to global education in the EFL classroom. Furthermore, based on Squire's definition of game literacy, the evaluation of the study showed that the use of serious games can contribute to the students' capacity to interpretative flexibility, specifically creative thinking while solving a problem. Therefore, by implementing serious games in EFL learning scenarios, students are able to exercise crucial 21st-century problem-solving and decision-making skills by attaining the games' goals through knowledgeable deciphering of modes that are goal-oriented. By adding serious games to the range of materials in the EFL classroom, teachers take into account the development of those competences that move beyond traditional notions of literacy and help students meet the changing demands posed by media and technology in the 21st century.

Works Cited


**Serious Games Used in the Research Study**


