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Gamification

Effects of games

Games suited for education

The use of games in learning – Case Study Section

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[Choose your own training adventure: designing a gamified SETA artefact for improving information security and privacy through interactive storytelling]

[Ersin Dincelli & InduShobha Chengalur-Smith]

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| 670 | Gamified systems provide a new method to design tailored programmes that not only educate users but also motivate them to learn and be engaged in tasks that they would otherwise consider tedious or difficult (Hanus & Fox, 2015)  Firstly, gamification has been effective in increasing engagement, changing behaviours, and learning new problem-solving skills in a variety of fields (Osatuyi et al., 2018), but not all applications are successful (Liu et al., 2017)  Thirdly, one of the few studies to apply gamification to data privacy training found evidence that the gamification approach increased participants’ awareness about their own data privacy, but found no evidence that gamification improved learning relative to non-gamified approaches (Baxter et al., 2016). |
| 672 | To increase the effectiveness of SETA programmes, Karjalainen and Siponen (2011) recommend using transformation-oriented training that is directed towards changing attitudes and behaviour by connecting with the learners’ experiences and allowing the learning to occur by evaluating the new knowledge they have gained and its personal relevance (Sheng et al., 2007).  Gamification can be used as part of a transformation-oriented training as it heightens user experiences and allows learners to self-reflect (Osatuyi et al., 2018).  Game-based learning is a technique that integrates games into instructional content by incorporating the characteristics of computer games to engage users and positively influence learning outcomes (Hamari & Nousiainen, 2015)  Learning science research has established that games are one of the most effective learning methods and can be highly motivational if they follow certain design principles (Quinn, 2005).  (Quinn, 2005, as cited in Dincelli & Chengalur-Smith, 2020).  One such design principle, *story-based agent*, advocates for the use of agents (cartoon-like or real-life characters) as part of the story-based content to help to guide users through the learning process (Sheng et al., 2007).  The use of storytelling in security gamification can stimulate curiosity and challenge users (Kapp, 2012).  Interactive storytelling that enables learners to make their own decisions that alter the course of the storyline and create dynamic narratives, such as CYOA-style stories, can also improve learning (Gaeta et al., 2014).  Another learning design principle, *reflection*, advocates that games should provide opportunities for the users to stop and think, i.e., reflect on the new knowledge they have gained (Sheng et al., 2007). |
| 673 | Textual content is stored in our short-term memory, whereas visual content goes into our long-term memory, where information is stored over an extended period of time (Burmark, 2002).  The human brain processes visual information much faster (Hyerle, 2000) and more effectively (Thorpe et al., 1996) than text.  Nevertheless, there appears to be some consensus in the recent literature that visual cues improve memorability and user experience (Liu et al., 2017; Mayhorn & Nyeste, 2012), while detracting from performance due to cognitive overload (Jenkins et al., 2012; Mirkovski et al., 2019). |
| 682 | Although this finding was consistent with the previous research, visual-based interventions might still be more effective for particular populations, such as young adults (Liang & Xue, 2010), senior citizens (Carpenter & Buday, 2007), or gamers (Baxter et al., 2016). |
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