An investigation of digital games features that appeal to young females and males

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32 children aged 11 to 14 from four schools in southeast England.

# Abstract

This research is part of an attempt to address the well-known problem of female underrepresentation in computer science education and industry. This problem starts between ages 11 to 14 and gets progressively worse in what is often referred to as the “shrinking pipeline effect”. There has been considerable research into the causes of the shrinking pipeline and attempts to halt or reverse it. In spite of this, the causes remain unclear and there is evidence that the problem may be worsening. Digital games are increasingly used in education because of their ability to engage and motivate young learners. Unfortunately, digital games used in the teaching of IT and computer science have been found to appeal less to females than males. This is in spite of the fact that digital games intended for entertainment, as opposed to education, are now very popular with girls. There has been some research into this issue, however more is needed, especially into what game features do and do not appeal to girls at the age that the pipeline starts to shrink. The study reported here aims to identify what characteristics of digital entertainment games appeal to young females and males. The results can be used to guide educators, researchers and game developers and provide criteria for evaluating the suitability of digital educational games for use with specific age groups and genders. We used open card sort with participants aged 11 to 14 to explore their attitude to a range of digital entertainment games. Open card sort allows participants to categorise items in ways that are meaningful to them. There were 32 participants (24 females and 8 males) from four schools in south-east England. They were shown video clips of ten popular games. The participants were then given ten cards, each representing one of the games and asked to sort them into categories based on shared characteristics. This process elicited 131 features (95 from the females and 36 from the males). The data was analysed to identify the features that were a) most significant and b) most appealing to the participants. The findings indicate that there are some gender differences in which game features are perceived as most significant. Some features, such as game action, are significant to the males whereas others, such as game levels, are significant to the females. Interestingly, some features that both genders find significant have different degrees of appeal for example “fun” and “violence”. We are currently using the findings in an experiment with 480 young people. Two digital educational games have been created: one includes features found to appeal to young females and the other includes the opposite or neutral features. The results of this experiment will be used to validate the findings of the initial investigation and form the basis for a framework to facilitate the inclusion of characteristics that appeal to specific groups in educational games and other software.

# Outcome

"Game action and game levels are evidenced to be gender-specific preferences from this study. Game
action is peculiar to young males as there seems to be a preference for high hand-eye coordination
requiring quick paced interactions (Gorriz and Medina, 2000). For young females the preference for
game levels can be associated with the requirement for a game to be purposeful. It also encourages a
non-competitive structure, exploration, less time pressure and failure threats (Lucas and Sherry,
2004).
There is another group of game features that are significant to both genders but differ in their appeal.
Examples of such game features include: game graphics, fun, character, violence, control, device,
storylines, mission and number of players. Female participants’ preferred cartoon graphic images
while the males preferred photographic images... Furthermore, game fun is significant to both female and male participants. However, the game
characteristics that create fun vary between genders. From the think aloud comments, game levels,
number of players, exploration, progression, complexity of game and game interactivity contribute to
the fun of the game for young females. For the males, it includes game violence, game action,
number of players, reward and challenge makes the game fun.
The number of players is also significant to both female and male players. Both genders are
community gamers but differ in how they engage with other players. Young males prefer to play in a
single mode but engage with other players in the community through challenges, competition and
action-oriented environments. In contrast, the females prefer collaboration in the gaming community
by sharing ideas, effective communication and team play." (Osunde et al., 2015: 8-9)... In addition, game violence is significant to females and males but varies in appeal depending on the
amount of violence. Females would play games with moderate violence as indicated from the think
aloud comments and likelihood analysis, while males prefer extremely violent games in most cases... Game colour differs significantly between females and males. Females prefer bright colours and males dark colours... Finally, game character and popularity can also greatly affect the appeal of games to both genders.
The females prefer games that are very popular. This provides opportunities to share ideas and
information with other players. However, males prefer games that are moderately popular. There is
also a difference in the preference for game characters and their use in the gaming environment.
From the analysed study data, young males prefer games built around the game character such as
the first person and third person games in a fantasy scenario. This may be as a result of the
preference for goal-oriented and action games. Conversely, females prefer games that are not built
around the character, such as life simulation games. The characters are preferably humans in a
realistic setting or real life scenario due to preference for social interaction, exploration and excellent storylines." (Osunde et al., 2015: 8-9).