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Girls' Perceptions of Characters' Gender Roles in Digital Games: A Study in Singapore

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ABSTRACT
This article explores girls' perceptions of (1) characters' gender roles, (2) game genres, and (3) female power status as portrayed in digital games through the lens of poststructuralist feminism. Research interests arise from identifying gaps in the findings and critiquing the research methods deployed by various related studies. The significance of the study is in adopting an innovative research method by empowering female participants as agents in designing game narratives to approach their perceptions more closely. Fifteen teenaged girls in Singapore participated in the study in 2009. The results indicate girls' preferences for future digital games to add customizable features for players to negotiate power relations between boys and girls in the most expedient manner and to allow girls to act as a social justice authority. On the basis of the findings, we suggest that there should be space for girls to express their unique and multiple female roles, further leading to autonomy in developing gender identity within various social and learning spaces.

KEYWORDS
digital games; girls; gender; learning

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INTRODUCTION

Digital games are becoming increasingly popular in both the home and school. In the United States alone, 65% of American households play computer or video games, and 63% of American parents support the idea that games play a positive role in their children's lives (Entertainment Software Association, 2008). In Asian countries, such as Singapore, 56% of youths between the ages of 10 and 15 have played or downloaded online digital games (Hung and Tan, 2007). In addition, a number of schools have begun adopting commercial entertainment games, such as Counterstrike and Starcraft, into curricula to broaden the scope of various learning strategies to engage youths (Chee, Tan, & Qiang, 2010). Secondary school students also engage in digital gaming for project work or curriculum reinforcement (Leung, 2008).

Moreover, gaming is not an exclusively male domain. For example, a study conducted by Tan (2008) discovered that 4 in 10 gamers are now women in both the United States and Singapore. Though more women are interested in game play, a virtual census of U.S. produced digital games revealed that girls are underrepresented in game character portrayals compared to boys (*Asian News International*, 2009). Even though there are games targeted at female gamers, gender stereotyping is prevalent. Various studies suggest that the majority of games are still gender stereotyped, with male characters cast as warriors for battling and female characters cast as damsels who ask for help (Dickey, 2006; Miller et al., 1996; Kafai, 1998). We believe gender roles in society have undergone changes and that the stereotypes presented by games do not reflect these changes. Hence there is a need to explore girls' perceptions of characters' gender roles portrayed in game genres because girls' preferences are not well understood and acknowledged by game designers.

In addition to characters' gender roles, girls' preferences for game genres are also in question. For example, a number of studies of gender differences in game preferences indicate that girls prefer violence-free role-playing games such as Nancy Drew, involving a female protagonist or a group of children unravelling a mystery (Subrahmanyam and Greenfield, 2000; Commission on Technology, Gender and Teacher Education [CTGTE], 2000), whereas boys prefer first-player shooter games. However, other studies (e.g. Tan, 2008; Hayes, 2007) indicate something contradictory: girls' game preferences can include online competition (such as Table Tennis Competition) in addition to fantasy. Therefore girls' perceptions of digital games are still inconclusive, particularly when girls are the consumers as opposed to active creators and have been exposed to female-stereotyped games (Beasley and Standley, 2002; Dunlop, 2007; Reinhard, 2006).

SIGNIFICANCE OF THE STUDY

Our concern is that this type of study, which positions girls as consumers only, instead of as active creators, cannot add depth to our understanding of their views. A number of scholars (Jenson, Fisher, and de Castell, 2011; Carr and Pelletier, 2008; Taylor, 2011) have remarked that the gendered gaming world has reflexivity. Because of the already gendered roles created in the nonhuman gaming world, observed female (or male) behaviours may reinforce such gendered images. For example, Jenson et al. (2011) suggested that studies about gender and gaming may show repetitive findings, strengthening such gendered views. Jenson et al. emphasized that innovative research methods are required when studying the perceptions and behaviours of girls, in order to break through such reflexive phenomena by which gender is imposed on them by the media.

Mentor (2010) remarked that girls' perceptions of digital games are located somewhere between their "own microcosm and broader societal demands (p 7)." In other words, girls' perceptions of games should be studied through empowering them to act as self-agents so as to explore their perceptions in multiple ways—not only by reflecting on the games created by others (mostly game designers) but also by actively creating the kinds of games (including game characters and narratives) they like.

The objective of this article is to explore girls' perceptions through a poststructuralist feminist approach. The significance of the study is that it deploys an innovative research method by empowering female participants as agents in creating game narratives. In addition, the participants explore their perceptions with the researchers at the same power level.

LITERATURE REVIEW: ISSUES AWAITING FURTHER STUDY

This section reviews the literature concerning female gender roles as portrayed in digital games and studies of girls' perceptions of them. The gaps in and issues among the various studies are elucidated to generate questions to explore in this study. In addition, we review the validity of the research methods of these studies to suggest an appropriate research design for our own study.

Gender stereotypes in digital games create unrealistic hypersexualised portrayals of both men and women in terms of the characters' physical appearance, behaviours, and personalities, and this has raised concerns (Reinhard, 2006). Male characters have been designed to appear strong and muscular, whereas female characters are portrayed as slim, voluptuous beings scantily dressed to accentuate their sexuality (Bryce and Rutter, 2002; Beasley and Standley, 2002; Delamere and Shaw, 2008; Dunlop, 2007). In addition, the behaviours and/or personality characteristics assigned to female characters in digital games usually render them subordinate to male characters (Reinhard, 2006) so that they stereotypically carry the characteristics of beauty, submission, materialism, stupidity, and inferiority (Bertozzi, 2009). This often results in boys perceiving female characters as 'damsels in distress' or 'love interests' (Reinhard, 2006). Moreover, the paucity of female characters in team sport games also fosters gender inequity by

misrepresenting the image and membership of women in certain arenas (Bertozzi, 2003).

Girls' Perceptions of Characters' Gender Roles: Inconclusive Findings

Even though various studies indicate that girls prefer these kinds of stereotyped portrayals (Subrahmanyam & Greenfield, 2000; Bennett, 2006; Turkle ,1984), a number of other studies have also indicated that many girls are averse to this. In particular, some girls are averse to the subjugation of female characters in digital games that subject female characters to maltreatment or violence such as being attacked or raped (e.g., in Grand Theft Auto; Bertozzi, 2009; Delamere &Shaw, 2008). Some authors (Delamere & Shaw, 2008) have pointed out that the root of this aversion among girls is that these images hold an underlying implication that females are less intelligent and are lesser beings than males. In addition, Beavis and Charles (2005) found that girls enjoy most of the female characters portrayed in games without gender stereotypes by taking part in both risk-taking and caregiving behaviours.

On the basis of these studies, girls' perceptions of the female characters' gender roles portrayed in games are still inconclusive. As some studies have indicated, some girls have no aversion to such stereotypes, whereas other studies show contradictory findings. We believe that such inconclusive views may arise from the insufficient opportunity girls are given to empower their perspectives in multiple ways, from being passively surveyed or interviewed to actively creating the kinds of female characters they like. In other words, girls' voices have to be empowered to further our understanding.

Girls' Perceptions of Game Genres: Mixed Findings

With respects to girls' preferences for game genres, most research studies have resonated with gender stereotypes. These studies confirm that girls prefer role-playing games with fantasy such as various dress-up games. In addition, real-life activities (such as shopping, going to the spa, taking care of pets, or gardening) that allow girls to customize story lines are also popular (AAUW, 2000; Turkle, 1984; Subrahmanyam & Greenfield, 2000). The following summarizes girls' preferences regarding types of game genres found by various studies:

1. romance and family relationships (Turkle, 1984; Bennett, 2006)
2. violence-free mysteries or action-packed adventures, such as Nancy Drew, involving a female protagonist or a group of children unravelling a mystery (Subrahmanyam & Greenfield, 2000; AAUW, 2000)
3. the reunification of humans, family, friends, and animals (Bennett, 2006)
4. exploration, travelling, and the manipulation of environments without the need to complete or win (Dickey, 2006; Miller et al., 1996)
5. real-world simulations that capitalize on one's identity through a variety of activities such as shopping or career experiences in real-world settings such as airports and classrooms (AAUW, 2000; Miller et al., 1996; Kafai, 1998)
6. fantasy and popular fairy tales (AAUW, 2000)

Various studies have agreed that females prefer soft-natured games such as those listed above; however, findings about girls' perceptions of fighting games involving violence have had mixed results. For instance, CTGTE (2000) and Hartmann and Klimmt (2006) found that girls are repelled by digital games because they object to combat and violence. However, other studies (Hayes, 2007; Delamere and Shaw, 2008; Bertozzi, 2003) have challenged this generalisation. The female participants in Hayes's study were not initially eager to participate in fighting tasks but found battle increasingly enjoyable. The female players also reported a sense of success and gratification from combat games on all-female gaming Web sites. In addition, Delamere and Shaw uncovered that female game players can enjoy fighting games once they gain power and are able to level up in the game. Furthermore, Bertozzi (2003) indicated that girls can enjoy combat games as long as male characters are not overpowered.

In sum, girls' perceptions of game genres, particularly battling games, are still inconclusive. Our observations of such inconclusiveness arise from the presence of stereotyped female character roles, such as roles that are inferior and less powerful, assigned in battling games. In other words, it is uncertain if girls are averse to battling games because of the nature of the genre per se or because of the unequal power statuses portrayed in the battling games between male and female characters. Hence girls' perceptions of digital games must be comprehensively studied by including their perceptions of characters' gender roles, game genres, and female power statuses as portrayed in digital games to understand the mixed findings in the literature.

Areas Needing Greater Exploration

On the basis of the review of these studies, two issues emerge that require further exploration. First, girls' perceptions of gender-stereotyped and hypersexualised characters portrayed in digital games need further investigation; in particular, it remains to be determined if girls' perceptions are correlated with unequal male–female power issues. Similarly, it brings forward the question whether girls' various views on battling games arise from gender stereotyping and unequal male-female power issues portrayed in the battling game. In short, gender stereotypes, types of game genres, and female power status serve as the research questions in our study; specifically, we ask, (1) What are girls' perceptions of game characters and gender roles? (2) What are girls' perceptions of the various game genres? (3) What are girls' perceptions of female power status portrayed in the game?

Critiques of the Research Methods Deployed

Among the previously mentioned studies (AAUW, 2000; Bennett et al. 2006; Cunningham, 2008; Dickey, 2006; Kafai, 1996; Kafai, 1998; Miller et al., 1996; Subrahmanyam & Greenfield, 2000), research methods used to explore girls' preferences vary. For instance, some studies used a mixture of interviews such as focus groups, think-aloud interviews, and clinical interviews based on a selection of different digital games (Bennett et al., 2006; Miller et al., 1996). Others, such as Beavis and Charles (2005), relied on observations of how participants enacted male

and female character roles through their game-play activities in The SIMs. Some other researchers (AAUW, 2000; Kafai, 1996; Kafai, 1998) have invited their participants to design digital game software to elucidate the game preferences of boys and girls.

It is noteworthy that even within the study of participants' digital game preferences through digital game design alone, there are considerable differences. For example, Kafai (1996) solely examined the game design process through participants' software designs and notebook entries, while AAUW (2000) required focus group participants to imagine a preferred game in writing only.

We believe that data collection by interview, observation, or game design through either programming or writing alone is not sufficient. We believe that perceptions must be expressed, including through thinking, talking, and doing. Exploring perceptions relies on empowering each individual as an agent to maximize the number of ways one can present one's thoughts. Therefore there is a need for more integrated research methods to be conducted to comprehensively explore girls thoughts, actions, and reflections and to triangulate among them.

METHODOLOGY

Distinct from research that has commonly used surveys, interviews and/or observations (CTGTE, 2000; Cunningham, 2008) to determine girls' perceptions and orientations towards digital games, the research methodology adopted in this study is a qualitative case study. The use of the case study offers an in-depth view of participants' perceptions, thoughts, actions and reflections through questionnaires, interviews and game-narrative design artefacts (Creswell, 2008; Gillham, 2000).

Research Framework: Feminist Poststructuralist Theory

The feminist poststructuralist paradigm is adopted as a research framework in the design of the study. Influenced by poststructuralist Foucault's (1980, 1990) manifestation of power and knowledge, feminist poststructuralists remark that the extent of our knowledge of women is tied to the extent of the power women and girls are given in presenting themselves. To fully empower the representation of women, Butler (1999) remarked that gender has to be approached through an understanding of the inner psychological acts rather than solely through outer performance. Butler was concerned that the outer performance of gender is a phenomenon reflecting social demands only. The powerful inner thoughts, which include reflections on struggles or prospects for the future, are more able to represent the deeper views of gender. In other words, the extent of our knowledge of women's perceptions depends on the extent of power each female participant is given to express herself through reflection and creation and to analyze her own views.

We draw on Davies and Banks's (1992) three key tenets of feminist poststructuralist theory to serve as a framework of our research design. Davies

and Banks elaborated three tenets that serve as guides in empowering women and girls by maximizing the number of ways they can uncover, present, and reflect on their perceptions. First, subjectivity is a fluid process in which a girl perceives herself and others through her daily experiences. Second, a girl actively selects her own positions through interaction with others, based on her own inclinations and decisions. Third, after multiple processes of generating, resisting, regenerating and transforming, a girl finally subsumes these positions and personalizes them, and other girls are in turn moulded by their self-selected positions (Davies and Banks, 1992).

Analogous to Davies and Banks's (1992) three tenets, our research design explores girls' perceptions of gaming with the following three research processes: (1) exploring their daily experiences and the perceptions they construct towards games through questionnaires and interviews; (2) elucidating the possible female roles and positions available for them to take on, instead of accepting the positions portrayed in the current games as innate and immutable, through designing game narratives; and (3) after game-narrative design, girls are empowered to reflect on the roles on which they have decided, and to project other female character roles previously unknown or unavailable to them, through both focus group interviews and reflection (Jones, 1993).

Maximizing the Number of Ways in Which Girls Can Position Themselves

To investigate girls' perceptions of digital games, we believe that the best methodology will allow the researcher to tap into perceptions in multiple ways, by letting girls project themselves as creators of future games, instead of as consumers constrained by the current commercially available game repertoire. In this section, we will discuss how designing game narratives allows for this.

Graphic-narrative creation

Graphic-narrative play allows children to personalize their artistic creations with their 'possible worlds' (Bruner, 1991; Wright, 2005) of knowledge by making selections in what to draw, write and/or tell and dramatize about their stories. Wright's (2005) study found that when young children, aged five to eight years, engaged in an individual fantasy-based experience through graphic-narrative play, the key elements of embodiment (taking on multiple identities of various story characters, e.g. as performer and narrator) and narration came alive synonymously as the children made meaning of what they were creating. Just as these graphic-narrative experiences allow for a diversity and richness of meanings to come through for children, such opportunities could also be extended to youths as they represent their perceptions of multiple roles through designing virtual game environments. In short, by designing digital games, girls are empowered with a free space to imaginatively construct, reconstruct and deconstruct their perceptions pertaining to gender roles that no other medium can afford.

Game narratives design

Narratives have been used in poststructuralist gender approaches to maximize the understandings of mental activities because of their richness of detail as mental models (Bruner, 1991) or modes of thought that acquire understanding through discourse and create a version of the individual's perceived reality (Bruner, 1991; Davies and Banks, 1992; Golden, 1996).

In terms of gender and perception, the sophistication of narratives gives participants the opportunity to develop their own preferred gender roles as they adopt, reject and conciliate dominant, disruptive or alternative gender meanings (Davies and Banks, 1992; Golden, 1996). The key ingredients in narratives enabling participants to enact and experiment with multiple gender role possibilities are imagination, embodiment and interpretation; these enable individuals to imagine, create, and reflect upon their and others' experiences and emotions.

Participants and Settings

Approval for this research to be conducted in schools was first sought from the Data Administration Department of the Ministry of Education in November 2009. Following that, a few all-girl secondary schools were randomly selected and contacted by telephone. Two all-girl secondary schools in Singapore responded and consented to participate in this research study.

Recruitment of participants was done on a voluntary basis after the teacher and researchers had provided a brief explanation of what the study entailed, namely, the design of a digital game. Amongst the volunteers, as far as possible, a natural selection of students was recruited for the study to represent the realistic situation in a typical school, in which students possess varying degrees of experience with playing digital games. A form for informed consent, coupled with an explanation of the research procedures and what would be required of participants, was provided to participants. As participants were under 18 years of age, both their assent and their parents' consent were sought. The study safeguards the identities of participants, which are kept confidential using pseudonyms. Research documents containing any identifiable information were destroyed on completion of the study.

The total number of student-participants was at first 18, but later, 3 withdrew because of personal schedule conflicts. This resulted in a total of 15 participants, who were divided into four groups, each consisting of 3–4 student-participants, to design their game narratives. The small number of student-participants from two case sites allowed the authors the opportunity for in-depth focus on each group case. The participants' background information, which was gathered from a preliminary questionnaire, is given in Table 1.

Table 1. Participants' game preferences: A general overview.

	Group A	Group B	Group C	Group D
Participants' demographic profiles				
Number of participants	4 participants: Doris, Lin, Mage, Sandy	3 participants: Emily, Courtney, Jazz	4 participants: Amanda, Maxine, Yin, Pam	4 participants: Mavis, Zann, Kim, Jill
Grade level	secondary one	secondary one	secondary three	secondary three
Average age	13 years 7 months	13 years 3 months	14 years 8 months	14 years 8 months
Ethnicity	Doris (Chinese), Lin (Korean), Mage (Indian), Sandy (Chinese)	Emily (Chinese), Courtney (Chinese) Jazz (Indian)	Amanda (Chinese) Maxine (Chinese) Yin (Chinese) Pam (Chinese)	Mavis (British) Zann (Chinese) Kim (Chinese) Jill (Chinese)
Participants' digital game-play profiles				
Degree of enjoyment in digital game play	All participants (Doris, Lin, Mage, Sandy) enjoy playing digital games very much.	Courtney and Jazz enjoy digital game play very much, whereas Emily does not really enjoy digital game play.	Amanda, Maxine and Yin enjoy playing games quite a lot, whereas Pam is OK with playing games.	Mavis enjoys playing digital games very much, Kim and Jill are OK with game play and Zann does not really enjoy game play.
Average age of first game-play experience (years)	8 Lin:6 Sandy:7 Mage:9 Doris:10	9.6 Emily:9- 10 Courtney:10 Jazz:10	7.5 Maxine:5 Pam: 6 Amanda:9 Yin:10	11 Jill: 7 Mavis:12 Kim:12 Zann:13
Number of games played in 2009	Average: 17.25 Doris: 21 Lin: 27 Mage: 8 Sandy: 13	Average: 16.66 Emily: countless (listed 6) Courtney: countless (listed 27) Jazz: a lot (listed 17)	Average: 5 Amanda: 3 Maxine: 5 Yin: 2 Pam: 10	Average: 2.75 Mavis: 6 Zann: 0 Kim: 3 Jill: 2
Digital game play at home				

Frequency of educational games played	Every week (Doris, Lin) Once every 2 months (Sandy) Not at all (Mage)	Every week (Jazz) Once a month (Emily, Courtney)	Every week (Maxine) Once every 2 months (Amanda, Yin, Pam)	Once a month (Zann) None (Mavis, Kim, Jill)
Frequency of entertainment games played	Every day (Doris, Lin, Mage) Every week (Sandy)	Every day (Courtney, Jazz) Once every 2 weeks (Emily)	Every week (Yin) Once every 2 weeks (Maxine) Once every 2 months (Pam)	Every week (Mavis) Once a month (Kim, Jill) Once every 2 months (Zann)
Digital game play in school				
Frequency of access to school's e-learning portal	Everyday (Doris, Lin, Sandy) Once every 2 months (Mage)	5 times a week (Courtney) 6 times a week (Emily) Once every 2 months (Jazz)	Once a month (Amanda, Yin) Once every 2 months (Maxine, Pam)	Every week (Zann) Once every 2 weeks (Mavis, Jill) Once every 2 months (Kim)

The school context allowed student-participants to interact with familiar individuals such as their teachers and friends. The research study commenced only after participants had completed their final-year exams so that it would cause minimal disruption to students' school functioning and exam performance.

Data Collection

The entire research study was first carried out through questionnaires, followed by a two-day game workshop and a post-workshop focus group interview conducted with student-participants from November 2009 through December 2009.

Pre-workshop questionnaires

To obtain a preliminary understanding of student-participants' background information and thoughts on digital games, a questionnaire was administered before participants attended the game narrative design workshop. The questions were structured according to student-participants' game-play preferences in terms of game genres, kind of game characters that they enjoy playing, type of game challenge, specific content interest and future digital learning possibilities. This information paved the way for the researchers to understand participants' digital gaming background knowledge and preliminary game perceptions in constructing post-workshop interviews

In-workshop documents

Participants were divided into four groups (A, B, C and D) using a process of choice and negotiation that met the project's principle of self determination. During the game-narrative design workshop, student-participants developed the story frames of their invented games by drawing and writing first, and then actualized game sets were made out of plasticine. In asking participants to represent their game narratives using concrete objects, participants needed to give thought to creating these products, thus allowing them to express their perspectives on digital games through a variety of 'languages' in terms of drawing, written words and physically constructed objects. Actualizing these artefacts through the act of 'doing' allowed the researchers to match student-participants' questionnaire responses to the objects and determine the consistency of their 'thought' and 'doing' processes. In addition, photographs were taken as student-participants designed their game narratives at 30-minute intervals. These photographs documented student-participants' evolving game-narrative design processes such as the order of story development and character designs. A key advantage of using photographs is that they visually enable the capture of student-participants' expressions and game narratives at various stages of progression (Warren and Karner, 2005). Additionally, audiotapes of student-participants' presentations of their final game designs were recorded and transcribed to analyse how participants expressed their personal digital game preferences.

In-workshop observations

The researchers assumed the role of complete observers without participation in student-participants' game-narrative design processes. Although non-participation could have removed the researchers from the participants' game-design activity, student-participants may have felt more comfortable without the researchers' participation owing to their unfamiliarity with the researchers (Creswell, 2008).

Post-workshop interviews

Semi-structured focus interviews offered the researchers an opportunity to discuss with student-participants' their perspectives on digital games in general as well as how their perspectives applied to their own designed game narratives. Such discussions had two purposes. First, they strengthened the comprehensiveness of the three research questions through student-participants' self-reflections on their game narrative designs. Second, they triangulated perspectives between the daily-life experiences participants described in pre-workshop questionnaires and the imaginative products they created during the workshop.

DATA ANALYSIS AND TRUSTWORTHINESS

To make sense of the information gathered, data in the form of text and images were coded and sorted by theme or category, a process also known as categorical aggregation (Creswell, 2007). A combination of emerging codes (interpreted from participants' information) and predetermined codes (derived from the research questions and existing literature) was used for data analysis.

A series of five steps guided the emerging coding process for secondary school A and B, respectively: (1) organize researchers' thoughts in terms of 'topics' or 'short notes' after reading every document line by line and noting their underlying meanings, if any; (2) list all the topics from all the documents and cluster similar topics in terms of 'major topics', 'unique topics' and 'leftovers', with the help of colour coding; (3) abbreviate the topics as codes next to the text segments; (4) find the best descriptive wording for the topics and order them alphabetically into categories; and finally (5) match elicited categories with relevant literature and sieve out new or unusual codes. These categories were further supplemented by student-participant quotations as direct evidence.

The participants' actual used language is adopted for coding. For example, 'gender stereotypes' is a possible code from the findings. The researchers connected, analyzed, and compared the themes and their respective descriptions amongst the four groups of student-designed game narratives.

The final step in data analysis focused on triangulating research findings within the study such as cross-comparing questionnaire responses with focus group interviews and with existing literature.

To strengthen the accuracy of the findings, multiple validity procedures were utilized. These strategies included (1) triangulation across participants' data responses; (2) member checking; (3) rich, thick description; and (4) peer debriefing auditing (Creswell, 2009). Finally, findings were proofread by a peer debriefer, who reviewed and presented questions about the study so that the findings would echo with individuals other than the researchers.

DATA ANALYSIS AND INTERPRETATION

A description of girls' multiple perceptions of their digital games are analysed theme by theme according to a three-pronged data collection scheme comprising questionnaire responses, game-narrative designs and focus group interviews. The findings are presented into three core sections, namely, (1) participants' perceptions of characters' gender representation, (2) types of game genres and (3) perceptions of female characters' power statuses.

Perceptions of Gender Presentation of Game Characters

As reported in CTGTE (2000), Subrahmanyam and Greenfield (2000) and Bennett et al. (2006), participants from groups A–D reported an inclination towards creating human characters who took on complex, real-world personalities without a special distinction between female and male characters (as shown in Table 2). Similarly, they expressed that they were averse to traditional stereotyped gender roles, personalities and customs.

Table 2. Game characters and roles.

Group	Game Characters and Roles
A	– Female protagonist (Amber). Supporting characters and antagonists are male. Supporting characters: Evil Lord Cyril and Cyril's son, Kaiser (evil prince) – Characters are given a personality, apart from good and evil or female and male, e.g. Kaiser: 'He is pretending he is a weak, useless idiot.'
B	– Protagonist (Bob the Stickman) – Supporting characters are all male 'misters': Mr Meatball, King Pineapple, Mr Fishball, Mr Crabstick, Mr Fishcake – Characters are all 'good' or helpful; all supporting characters are guides to help the protagonist meet King Pineapple.
C	– Choice of male or female protagonist – Antagonist: male villain Supporting characters are a mixture of male and female (mother-in-law) but are mostly male (fisherman, scientist, village chief and father-in-law) – Role of supporting characters is to provide information and clues for the game; player/protagonist and scientist act as advisors throughout the game, except for the final quiz duel
D	– Male protagonist (explorer) Supporting characters: 1. Strong gorilla to help cut down the tree 2. Camel that can store great amounts of water but may be slowed down by the process due to its heavy mass 3. Intelligent bug that has size options that increase with intelligence and provide player with hints throughout the game 4. Flying ostrich with high speed but no intelligence – Characters are not given a personality, just attributes, which the player needs to determine and compare to come to a wise decision

The focus group interview conducted with groups A and B strongly revealed participants' heightened awareness of gender stereotypes in digital games. Participants expressed their disdain with how girls were portrayed in terms of appearance and disposition, which aptly perpetuated real-life gender stereotypes:

> I think it's really important for girls to design games because we need to show . . . that we're not those dainty little damsels in distress who

> just sit there and scream for help. . . . We can't just sit there and think 'Oh girls like pink, let's make their clothes pink! Oh girls like this, let's do this! Oh girls like to cook, let's make cooking games! . . . In real life and in games. Pink! Everything is pink! (Doris-A)

On the basis of the focus group interviews, there was consensus amongst participants that there may be suitable games for girls but the current repertoire of games is 'general' and not specifically targeted towards or designed for girls. The limited array of games that are currently available are:

> only extreme games for girls, they always think we're so girly . . . those type of dressing up . . . or cooking games that are . . . not exactly my favourite. (Courtney-B)

Participants' aversion to and discomfort with the way female game characters are currently portrayed were echoed by other group participants such as Lin-A:

> You know the costumes that the female characters wear, it's like really revealing and I don't like it.

In the end, group A adorned their character with typical jeans and a T-shirt, as Doris-A explained, finding it more practical to dress the character simply than in frilly clothes. Although some participants did not think that girls' role in the design of games mattered, the majority of groups A and B were more avid digital game players, as evidenced by the highest average number of digital games played through 2009 (group A, 17.25; group B, 16.66), and shared the same viewpoint as Doris-A, Lin-A and Courtney-B:

> I think it's [designing games] important because guys don't really know what girls like. At least we are girls, we know what we like, and we can also ask around. (Jazz-B)

Perceptions of Types of Game Genres

Mixed preferences include both traditional feminist fantasy and prototypical masculine battling games.

Participants from all four design groups were found to share wide-ranging game preferences, including preferring female-oriented games such as fantasy, romantic and cooking games as well as battling games.

Overall, participants' responses strongly reflected their common and also uniquely differing preferences for game genres of all types, feminine or masculine aside. This strongly suggests the need for a greater diversity in game genres, as participant Emily-B aptly put it:

> There's no type of genre that we all like. . . . I guess different people have got their likes and dislikes.

In response to Emily-B's statement, Courtney-B explained that her group 'enjoy[s] fighting, but we don't want the whole game to revolve around fighting only. . . . Maybe we have survival skills also thrown in there, like cooking also . . . a bit of romance, but then you have to mix'.

Girls may enjoy playing battling games once female peers team up. The presence of violent content in digital games surfaced as another area where participants responded with mixed attitudes. The presence of violence, defined as any form of fighting or attack waged in the game context, was analysed across all four groups. Two groups (A and C) incorporated forms of fighting, such as stabbing or duels involving magic weapons, into their game narratives, whereas groups B and D designed virtually violence-free game narratives without any forms of battling.

Though group C's participants did not indicate a preference for fighting games in their questionnaire responses, they integrated a final battle between the protagonist and the villain in their game narrative, where every wrongly answered question posed by the villain would result in the protagonist being stabbed. The strong presence of fighting in games was further exhibited by Lin-A, whose inclination for fighting digital games was clearly transposed into her group's game narrative, which was heavily laden with fighting dragons and monsters:

> And then comes the evil skeleton, and there's Amber, fighting all alone. Oooohhh . . . [made sound effects]. The skeleton dies. (Lin-A)

Although groups B and D designed violence-free game narratives, group B's justification for averting fighting games stemmed from the mundaneness of fighting, which Courtney-B explained as being aggressive or intimidating to her:

> I play fighting games also. . . . I like to play Halo [but] it's quite boring to fight all the time, [and the effects of sole fighting can be] very violent and aggressive thoughts. It's quite scary. (Emily-B)

Rather than generalising that girls are averse to battling, this study shows that whereas some girls may enjoy violence in moderate doses, others could actually prefer playing entirely violent games. The current study also reaffirms Hayes's (2007) conclusion that not all girls are averse to fighting or any form of battling that involves violence. Contradicting Walkerdine's (2006) study, in which her participants tussled between maintaining a feminine position and executing 'masculine' kill moves, group A's participants actually sought pleasure in the act of 'killing', without relating any discomfort in having also to maintain a 'feminine' position once a female teams up. In fact, group A indicated in their questionnaire responses first-person shooters or battling games as their top preference for digital games.

Perceptions of Girls' Power Positions in Games

As Table 3 indicates, out of four groups, two groups (B and D) designed no female characters at all. Although two groups (A and C) did design female characters, the proportion of female to male characters stood at only 33.3%. At least one of these female characters also starred as the protagonist in each of group A's and group C's game narratives. The rationale for participants' selection of male, female, or neuter characters was explored through the focus group interviews in order to shed light on how participants perceive the female role, particularly its relatedness to power issues in game. We found there were three types of perceptions amongst our participants.

Table 3. Game genres and characters' gender presentation.

Group	**No. of male characters and assigned male character roles**	**No. of female characters and assigned female character roles**
A	2/ 1 antagonist (evil opponent Lord Cyril) 1 supporting character (helping character: Prince Kaiser)	1/ 1 protagonist (main good character, Amber, who saves the world heroine)
B	7/ 1 protagonist (Bob the stickman, who saves the world hero) 6 supporting characters (helping characters: Mr Fishball, Mr Crabstick, Mr Fishcake; gatekeepers: King Pineapple and Mr Meatball)	N.A.
C	6/ 1 protagonist (choice of male fiancé option) 4 supporting characters (helping characters: 1 father-in-law, 1 village chief, 1 scientist, 1 fisherman) 1 antagonist (villain)	2/ 1 protagonist (choice of female fiancée option) 1 supporting character (mother-in-law)
D	1/ 1 protagonist (male American explorer-survivor)	N.A.

Female characters as saviours

All of group A's participants indicated their preferences for playing a female character in their questionnaire responses and actually designated a female protagonist, tasked with saving the world – a noble mission – in their game narratives.

Male role-play to experience boys' empowerment in virtual realities

Conversely, the majority of group D's participants indicated their preferences for male characters in their questionnaire responses as male characters made them feel more empowered in the virtual world than in reality. Participants clearly translated this preference through designing a male explorer as their main character. Groups C and D justified their groups' choices of all-male characters for practical reasons. For instance, group C's designed game was set in medieval times, when, they believed, battles were better fought by males, and they wanted to feel firsthand the power given to men in that era.

Negotiation between girls' and boys' ways of exacting power

Group C's and group D's participants' choice of female characters or characters of ambiguous gender could be explained by Walkerdine's (2006) findings. Group A's choice of a female main character as being dually cute and powerful coincides with what Walkerdine (2006) terms a method of the masculinity of game playing (commonly associated with fighting, killing, winning and action). In addition, group B's comical, male, nonhuman characters, such as Bob the Stickman, seemed to be a way for participants to empower themselves. According to Walkerdine (2006), a cute male avatar who is 'powerless' inadvertently accords the female player with power.

DISCUSSION

Though much of the participants' digital game preferences are consistent with the preferences reflected in existing literature, in terms of popular game genres amongst girls, the current study found additional preferences not reported in the literature. These are discussed in the following sections.

The Contribution of the Study

Through this study, participants indicated their preference for future digital games (1) to characterize various personalities in order to disrupt gender stereotypes, (2) to offer a medley of genres not limited to battling or fantasy gender-stereotyped genres and (3) to add customizable features allowing players to select from a variety of male, female and ambiguous character types to allow youths of both genders to negotiate power relations in the most expedient manner possible in the virtual world.

In addition, contrary to stereotypical expectations, this study has also shown that girls are not averse to battling and may enjoy battling and violence in moderate doses, while others may even enjoy a high dose of battling in their game play. It is noteworthy that there was no hint of female subjugation in all four groups'

designed game narratives. Rather than being subjects of violence, female game characters were designed to use violence to uphold moral justice or to act as saviours. In addition, another reason for girls to enjoy battling games is that they might allow girls to team up to fight.

In sum, our female participants perceived that game narratives should be purposefully designed with open room to manage power, customize game characters, disrupt gender stereotypes and negotiate between girls' and boys' roles and identities. For example, as shown earlier, creating a female character or an ambiguously gendered character is a way for girls to manage power relations. The two groups that designed female or neuter game characters attempted to balance power relations between attractive and nurturing female identities and battle-like masculinity, typically associated with power. This could be attributed to participants' awareness of how women are stereotyped in digital games, such as female game characters' hypersexualised portrayals, which spurred the participants to create more realistic female game characters.

LIMITATIONS

This research might encounter three potential challenges. First, as participants designed their game narratives in groups, individual voices may have been overpowered by more vocal members in the group. Future research may consider distinguishing between individual participation and group dynamics in collaborative group work.

Another limitation to this research study is that no game design software was used, unlike in other game design studies (Carbonaro et al., 2008; Robertson and Good, 2005; Robertson and Howells, 2008; Druin et al., 1997). On the one hand, this may serve the purpose of allowing an open process of design, outside of the confines of computer programs, to comprehensively investigate girls' perceptions. On the other hand, it is uncertain whether participants' motivations in the study were realistic, given that participants are unable to materialize their game narratives into authentic digital game products for game play.

Third, the study is based on a small sample drawing only on two classes of adolescent girls from two secondary schools in Singapore. Hence findings may not be easily generalisable to students from other schools or countries. It is hoped that similar research will be conducted with greater samples across more schools, age groups and other demographic groups and cultural communities so that more generalisations can be drawn and comparisons more effectively made.

In addition, gender roles in each country differ because of the countries' unique cultural contexts. These, in turn, shape one's digital game perceptions, as has been acknowledged by several scholars (Hartmann and Klimmt, 2006; Hayes, 2005; Miller et al., 1996). In a case study, one of Hayes's (2005) participants preferred to have her game character heal rather than fight in the game because of her religious beliefs and emulation of her philanthropic parents. This illustrates how familial, cultural and school circumstances can justify choices made by game players.

CONCLUSION

In the era of boundless learning and changing society, learning and thinking have crossed the different spaces of school, society, digital media and virtual realities. Subsequently, the learning landscape has changed from positing students (or citizens) as knowledge consumers to positing them as knowledge producers (Gee, 2003; Hong and Sullivan, 2009), whereas thinking has moved fluidly from experiencing to critically reflecting on and changing premises such as gender roles (Mendick, 2010). The relationship between consuming and producing by experiencing and reflecting is dynamic and reflexive – as Fiske (1987) called it, pro-sumer.

Hence how girls mediate the reflexive relationship between consuming and producing game narratives and their portrayed gender roles and power has been reflected in our study. Our female participants expressed the need to eliminate biased gender stereotypes of women and men; to magnify contemporary girls' multiple roles of being adventurous heroines in battling games while retaining feminine qualities; and to empower women as the justice transformers in society. These findings have added depth to the multiple case study and game narrative developer approaches, complementing previous research, which mostly used only surveys and interviews. We suggest that educators, when adopting game-based learning in the school context, be sensitive to the issues of girls' needs and empowerment. Proper space for authoring should be provided to allow girls to exercise power and authority and to present their tacit knowledge and hidden identities in accordance with changing social contexts and gender roles.

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