Aussie women game developers

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ABSTRACT

Women are underrepresented in the digital games industry all over the world. In Australia, women's level of contribution to game development is much lower than the USA, Canada, and UK. Reviewing literature from the areas of computer science, information technology, and digital games, this study focuses on the impact of social, structural and cultural aspects, and how these factors might influence women choosing a career in the Australian digital games industry. Using a mixed-method, Grounded Theory approach, a large-scale census of Australian digital game studios was conducted, and followed up by semi-structured interviews of a small group of women game developers. Findings reveal that the number of women game developers in Australia has recently increased, and although work culture stereotypes and poor workplace conditions persist overseas, Australian women are not experiencing these issues. However, getting interested in digital game development is still a major obstacle in convincing young women to enroll in game development degrees at university. Once enrolled though, attrition is a problem that has been attributed to teaching styles, lack of confidence and how male peers treat female students in their first year. Those women, who eventually graduate and pursue a career in digital games, more often share the influence of strong parents, male siblings, and enjoyed playing games from a young age.

Categories and Subject Descriptors

K7.1 Computing Profession, Occupations

General Terms

Measurement

Keywords

Australia, digital game industry, females, gender, students, women

1. INTRODUCTION

The digital games industry (DGI) has emerged as one of the fastest growing entertainment sectors in Australia. It is now more than double the size of the local movie box-office, with sales reaching an all-time high in 2008 to $1.96 billion [25]. Despite this growth, according to the Australian Bureau of Statistics (ABS)[2] in 2007, of the 45 game development companies in Australia, there were 1,431 employees; of which 154 (10.5%) were female. In 2012, those figures changed dramatically due to the rise of smaller indie studios after the closure of many of Australia's larger game companies as a result of the GFC. The number of digital game development businesses in Australia

increased to 84, whilst the total number of employees dropped to 581, of which only 51 (8.4%) were female [3]. Overseas, women represent around 16% in the USA and Canada, [31, 42], and 12% in the UK [33]. Comparably, in the Australian information technology (IT) industry, women make up 20% of the workforce [7], and in the same ABS 2012 census women represent 39% and 46.7% in the film and television industries respectively [3].

2. LITERATURE REVIEW

The literature reviewed for this study covers 3 areas. Firstly, the *theory of individual differences,* explores how career choices are not hardwired, but is rather due to influences, experiences and personal characteristics. Secondly, the 'pipeline issue' and how because girls shun technology and games it later influences them as young women to choose not to enroll in IT degrees. Finally, within the DGI, what barriers prevent women entering the industry, or once they enter, why they then choose to leave.

2.1 Individual Differences

To help explain the low participation of women in IT, Trauth [53] compares two dominant theories; the Essentialist and the Constructivist. Essentialism is the claim that male and females have biologically or psychologically imposing gender-based limitations that are hardwired [4]. Trauth et al. [54], maintains that this essentialist view reinforces gender stereotypes, perpetuating the notion that gender categories are predetermined and fixed. In contrast, Social construction theory (also known as the *theory of individual differences*), claims it is a combination of personal characteristics, such as abilities, interests, and personality traits, as well as our earlier experiences, and the effect that family, peers, mentors and role models have on us that make us unique, and that all these factors together are what influence a woman's choice to pursue a career in games [53, 54].

2.2 The "Pipeline" Issue

Although it is not a requirement for game developers to know how to program [40], the areas of IT and computer science most closely align with digital game development as many universities now offer degrees in game design and development, usually within their IT faculties. Much of the literature reviewed relates to the IT industry, as it is largely assumed that issues women face in IT, are also experienced by women in the digital games industry.

The low participation of women in the DGI is recognized as a "pipeline" issue [48], as the number of women graduating from computer science degrees has been in decline for some time [11], and has been traced to experiences that female students face in middle and high school. The main cause has been found not to be a lack of ability, but rather a lack of interest by girls about technology, computers and digital games [19, 48]. Although playing games is perceived as fun, game programming however, is seen as a solitary, difficult, boring and non-creative pursuit, which has very little appeal to women [11, 48]. This lack of interest ties directly into the perception that computers and games are

masculine pursuits [33], and is further reinforced by cultural expectations and social influences [48].

2.3 Early influences of career choice

While young people seem to have a positive attitude towards computers, technology, and digital games, this response does not always manifest itself in career choice [5]. Little empirical research has been carried out in Australia examining career and subject choices made during middle and high school years [14]. Studies indicate that decisions regarding career paths are made much earlier, between the ages of 11 to 17 [5]. Many young girls in high school will already have decided against technology and may not have even considered that game development is even a possible career choice [5, 23].

2.3.1 Gender roles & stereotyping

Gender roles have expectations about how one should think, act, and feel. These beliefs which we grow up with are based on structural and social influences, which all shape how a girl perceives her role in society [5]. While parents and teachers may encourage girls to look outside of traditional careers, beliefs about role-appropriate behavior for women often restrict career choices, depriving industry of talent [14, 29] as role models may inadvertently reinforce perceptions about careers based on gender that society imposes [5].

2.3.2 Peer and parental influences

Embedded stereotypical attitudes play a large role in how family and friends influence; both encouraging and discouraging young girls from exploring careers in male-dominated fields like game development [8]. Students with parents who have tertiary qualifications manage to defy gender stereotyping, and conversely, parents with lower levels of education are more likely to reinforce them [5]. During adolescence, the effect that boys have on girls is often observed to affect how females see themselves, their classroom experiences, self-efficacy with computers, and their goals. However, older male siblings often influence their younger sisters into masculine careers [5, 48].

2.3.3 Lack of role models

No-one doubts that positive role models play an extremely important role for females looking to pursue a career in digital games [13, 29, 33, 55]. Enderton [20] suggests encouraging girls to have role models as early as middle school, as once they reach their teens, role models for girls more often promote lifestyle and social behavior through music, movies and sport [5], whereas, career-choice role models are usually family members. In 'intact' family structures, that is, where there is one female, and one male parent, strong father figures positively influence a daughter's choice of technology careers, whereas in same-sex parent or single parent families, girls are more likely to cite their mothers as role models [41]. It seems that attending an all-girls school may provide more positive role-models than co-ed schools [14], though it has often been seen as a disadvantage as far as there being a lack of 'boys' subjects' available for girls to explore [55].

2.3.4 Confidence

The perception for most girls about what they are good at is rarely the reality, and confidence, or lack thereof in their abilities, can have an insidious effect. Compared to males, females often underrate their technical capabilities, whereas males are much more confident, though this is often inflated [55]. Whilst girls dislike failure at any level, they are more prepared to spend extended time at the computer trying to solve problems [14]. For males though, when it comes to coding prowess, studies at university have shown that because of the deadlines placed on students, males widely believe that speed, rather than quality of code is a measure of ability, which is reinforced by teachers [37]. This disparity is emphasized when women find themselves in the minority where 'establishing an identity of competence becomes critical to defining a place in the [Computer Science] culture' [37]. Because of the higher proportion of males in IT courses at university this is also thought to contribute greatly to unease that women experience to the point that they drop out of studies.

2.4 Barriers to entry

2.4.1 Work culture stereotypes

Even with an education in IT, relatively few women consider or apply for roles within digital games. Part of the reason is the negative perception of the industry [1, 22, 57, 59]. The male-dominated digital games industry is perceived, often correctly, to be exclusive, with a higher tolerance for discrimination, sexual harassment, male humor, and patronizing behavior [8, 27, 30, 49], leading to the perception that working for a game company would be a challenge for most women. In an online interview discussing the so-called, *frat-boy* culture in the games industry, co-founder of Green Door Labs, Marleigh Norton remarked, 'If you are a woman in the industry, there are all these little signals that you are not part of the club, that this is not your tribe' [61].

Comments regarding the treatment of women who work in games, playing games, and attending industry events, escalated in November 2012, when Luke Crane, a game designer asked on Twitter why there as so few 'lady game creators' [56] resulting in dozens of online articles on the topic. Responses spawned the hashtag *#1reasonwhy*, and a huge reaction from the public, both positive and negative [57]. From, how women game players frequently receive hateful comments and threats in-game for playing games that are, 'meant for men only' [21], to women being groped, and sexually harassed at game developer conferences [1, 61], industry events which exhibit topless women, and blatant misogyny [52, 58, 60], hateful backlashes from players asking for female game reviewers to be sacked after citing certain games as being misogynistic [26], to women developers being told that 'they should go and make their own games elsewhere instead of trying to work in the existing industry' [1]. Games industry veteran, Brenda Brathwaite (now Romero), criticised how some game company recruitment ads 'scream fraternity' [60], and that recruitment parties with strippers have been thrown, reinforcing the perception that women need not apply.

Granted, most of these reports never make it into the mainstream media, so it is unlikely to dissuade the average female from considering games as a career option. However, those women who do keep up-to-date with what's happening in the industry are usually gamers, and, are also more likely to be interested in working in digital games. This negativity all round, is far from encouraging for women who may want to choose game development as their career path.

2.4.2 How women are portrayed in games

Like their male counterparts, women want to make games that they themselves would want to play [33], so naturally they want to work for companies that create the types of games they too would enjoy. Game titles that contain barriers for females do more than just alienate the female audience, they also convey an attitude toward women in general, whether it is true of the company or not [32]. Women may be discouraged from the game industry because of how they are portrayed negatively [17], usually depicted weaker, shown as victims or prizes [18], or unacceptably as hyper-sexualised figures [17, 33, 34, 39, 61]. If game developers treat

female characters this way in their titles, then it does not take much imagination to assume this is how they might treat female employees. If a company's titles are inherently unattractive to female players, then it is very unlikely that females will consider wanting to work there [23, 38]. Fullerton believes more women would enter the industry 'if there were more games on the market to inspire them' [15].

2.4.3 You need to be a hard core gamer

The general perception many people have about being a game developer is that you also have to be a hard-core gamer [12]. As Tracy Fullerton explained in an interview with EDGE magazine at the Game Developer's Conference, some people believe 'if you're not dedicated to hard-core games, you're not a gamer. That leads some aspiring female designers to doubt themselves because they prefer so-called "casual" games, not Gears of War or Halo' [28].

2.4.4 Making games is not a 'real job'

Although the skills required may be similar for IT and digital games, most computer science graduates aspire to a professional career, and whilst the games industry itself may sound fun and glamorous, it is not perceived as a professional, long-term career with stability or security [62]. A seven-year veteran of the ADGI from Melbourne, in an interview regarding the downturn caused by the GFC, remarked how in 2009 he was forced to 'take a job in the real world' [9], suggesting that even industry veterans are not totally convinced that working in digital games qualifies as a 'proper' career.

2.4.5 Lack of information about industry

According to Sheri Graner-Ray, chairwoman of the steering committee of non-profit *Women in Games International* (WIGI), many women will not have considered the game industry as a possible career choice simply because of the lack of credible information about roles available [32]. In a report on the DGI in the UK, when women who worked in the industry were asked, they said that finding ways of getting women interested and aware of the industry was deemed more important than improving working conditions [33], presumably because they believed that working conditions were improving, but that the visibility of the industry was not.

2.5 Retention issues

2.5.1 Working conditions do not appeal to women

Crunch time, that 'frenzied period of development right before a game gets shipped' [60] has almost become a requirement and accepted practice in many digital game companies where staff have fast food delivered and are 'locked up', in order to meet deadlines [55]. When crunch occurs over a long period there are diminishing returns when employees are forced to work in excess of what they are able to tolerate both physically and mentally [43]. Not to mention that it is often unpaid [62], as was widely known to have happen at Team Bondi's studio in Sydney during the development of *L.A. Noire,* which was released in 2011 [35]. Many companies argue that because game developers are passionate, that passion can only manifest itself in 'relentless schedules and minimal compensation' [6], which normalize the culture of long hours [43]. According to an Australian workforce study, women are more than twice as likely to be demotivated by long working hours and lack of workplace flexibility than their male counterparts [7]. Because women have the responsibility of both rearing children and maintaining a household, having children is regarded as a constraint [32]. The combination of personal responsibilities and long work hours becomes stressful and tiring which leads many females who are passionate about

working in the industry to decide not to have children [30], therefore eliminating the need for flexible scheduling and shorter hours [16].

2.5.2 Pay disparity

Australian studies have shown that there are still significant pay disparities between men and women working in the IT industry [7]. While there have been no recent figures published specifically for the Australian digital games industry, it is widely believed that wages paid by Australian game companies are still lower than in other countries resulting in a 'brain drain of Australian talent, particularly compared to the United States' [9]. More recently, the *Game Developer Magazine* conducted an international survey of game developers, broken down by gender and role, which was published in *The 2013 Game Developer Gender Wage Gap* [51]. Apart from female programmers, women are under-paid in every other role within the game development pipeline compared to their male counterparts by up to 22% [24].

2.6 Summary of literature review

With a lack of research undertaken in this area within Australia, because of the close cultural ties, a high proportion of the research data in the literature describes experiences from either the USA, or the UK. Notwithstanding this, the issues covered still appear to be interconnected, in a reinforcing "chicken and egg" cycle.

There is a gender imbalance in the ADGI, which has been attributed to less women seeking positions because of real or perceived barriers to entry [36]. The "pipeline" issue further exasperates the problem with women not choosing game development degrees at universities. In fact, most students have made their career choices in middle school where cultural and social influences already steer girls away from games and technical fields.

3. METHODOLOGY

The research was conducted in four distinct phases with the aim of identifying a small group of women who were actively contributing to game development in Australia [50]. Not all businesses operating within the Australian DGI, actually develop digital games, and not all women who work for game development companies actually create games, so the scope needed to start out broad and become more granular until the core community of women game developers could be identified.

Phase 1: Construct database
• All known businesses in the Australian Digital Games Industry

Phase 2: Census sent to 356 companies
• All known Australian Game Development businesses

Phase 3: Survey sent to 63 women
• Women who work for an Australian Game Developer

Phase 4: Interviews with 10 women
• Women who *are* Game Developers

Figure 1 - Four phases of data collection

During the initial phase, a database of all businesses within the Australian DGI had to be created, as there is no official source with an up-to-date list of every digital game company nationwide. Phase 2 entailed emailing a census individually to every known digital game company across Australia. This phase was instrumental in helping to identify companies that actually develop games, and have female employees. Phase 3 involved sending out invites to 63 females who had been recognized during the second phase, to fill in the *Aussie Women Game Developers* survey. In Phase 4, a small group of women was selected to be interviewed.

3.1 Interview of women game developers

The final phase and primary focus of this research was a one-on-one in-depth, semi-structured, open-ended interview with 10 Australian women game developers. One-on-one audio interviews via Skype meant that the interviewer and respondents did not have to travel and could participate from the comfort of their own homes, allowing for flexible hours. Interviews lasted between one and three hours using an extensive list of questions specific to issues that women working in the Australian DGI could relate to. These were drawn from the areas of *Individual Differences*, the *Pipeline Issue, Early influences in career choice,* and *Recruitment & Retention,* and covered family background, childhood, interests, game playing habits, role models, experiences at school, university and work. Because the researcher had shared experiences both in the local industry and at university, it was conducted more like a conversation, comparing notes and experiences along the way, rather than a straightforward, question and answer session. Responses were transcribed on the fly using a combination of full quotes, phrases and memo codes. This allowed the interviewer to take notes discreetly without making the subject feel self-conscious or disrupting the conversation flow. It also enabled data to be searched, sorted, and analyzed later on.

3.1.1 Sampling and target respondents

Based on the target criteria: - that the respondent *must be female*, has *worked in the Australian DGI*, and identifies as someone who *has worked for a game development company in a role where they have contributed to the creation of games*, there were 31 who qualified, but only 10 candidates could be chosen to participate in the one-on-one Skype interview. Created from demographics data collected in the phase 3 survey, a non-probabilistic quota sampling method was used to construct a quota framework matrix which describes characteristics of the target population based on proportions of the total population. For this study, not knowing whether the sample of 31 potential subjects was a good representation of all women game developers across Australia, and because the sample size was restricted to ten subjects, participants were selected from a cross-section of data. This included the respondents' location (state), their most recent job (excluding those overseas), work capacity & number of hours worked each week (preferably fulltime), their job role (technical - v- creative), the size of game company they worked for, the type of school they attended, the type of degree qualification they have, and how long they had been working in the industry.

Table 1 - Phase 4 - Final list of 10 interviewees

Code	State	Qualification	Role	Yrs	Studio Type & Progression
KAL2	NSW	BSc IT	Programming	2	AAA > left industry
SIJ1	ACT	Dip Game Dev.	Programming	<1	Grad > Start Up Indie
HMC3	WA	BSc IT	Programming	3	Medium-size studio
SON4	QLD	BA Film	2D & 3D Art	10	AAA > Own business
KSS2	VIC	Bach Game Dev	Art	1	Start Up Indie
GAA2	NSW	Dip Game Design	Design	5	AAA > Overseas
FOR2	NSW	BSc IT	Programming	3	Own Business
SOM3	QLD	A.Dip. Game Dev	Testing / QA	4	AAA > Own business
AIA2	VIC	BSc Game Design	Design & UI	<1	Start Up Indie
MAM3	ACT	PhD AI	AI Programming	8	AAA Company

Potential subjects were then contacted to see if they were available to attend an interview within a two-week timeframe during November 2013. The result of the sampling is the list of ten interview subjects as shown in Table 1. For anonymity, each interviewee was assigned a random code.

4. FINDINGS

4.1 Is there a typical female game developer?

Each interview started out asking respondents to describe themselves, their family background, and interests as a child. Many enjoyed literature and fantasy, and where some were social, a few admitted that they were tomboys. This all sounds typical of a young girl growing up in Australia. However, within the first few minutes of each interview, a theme emerged. As much as the reviewed literature discusses stereotyping and its negative implications and impacts, on women game developers in particular, it was surprising how stereotypically similar many of the women who have eventually chosen to work in the Australian digital games industry, actually were as kids. Self-described as a nerd, an introvert, a bookworm, often liking anime, avoiding athletics, and someone who didn't mind their own company as a child, and above all, they were avid gamers from around age 7 after they got their first PC, console, or handheld. From then on, they were hooked. At school, they were above average students who like science and technical subjects, tried hard, and liked to please their parents and teachers.

Unlike many males who self-identify only as a programmer, the women who work as game programmers, considered themselves more versatile – as being *'both techie and creative' (SOM3),* being able to *'program "creatively" as opposed to coding banking software' (SIJ1),* yet also being able to design games and create art and game assets as well. Many taught themselves *3D modeling and rigging,* and how to *code* and *mod games* in their spare time. The marked difference between IT students and game development & game design students was the emphasis of being able to express creativity in programming [10].

4.1.1 Playing games

The women all still enjoy playing digital games, however, not to the same degree as when they were younger and liked to play AAA, RPG, MMO, and RTS games. Those with partners say that they actively play games together, or else, *make* games together. These days though, most play casual games on their phones and online - not because they prefer them, but more because they *'don't have as much free time* [and] *casual games allow you to play in small bursts' (MAM3).*

The most marked revelation was the influence of male siblings as far as their interest in playing games was concerned. As a child, unlike boys who like to play alone in their room, all said they have fond memories of playing video games with their *brothers, uncles, neighbors,* or *cousins,* with most attributing a male, usually a brother, for having 'gotten them into games' in the first place.

'Our parents treated me and my brother the same when it came to toys. We played the same video games and preferred to play with Lego together rather than him play with trucks, and me play with dolls' (MAM3)

4.1.2 Childhood influences

As new patterns started to emerge, in keeping with the Grounded Theory approach, it was necessary to deviate from the set of planned questions and enquire further about the influences of siblings they grew up with and in particular their birth order (Refer to Figure 2).

Two respondents were from a single-child family, three women were the eldest of two (the younger being male in each case), and the remaining five respondents, were either the middle, or the youngest child, who only had the influence of older and/or

younger male siblings. None of the ten women had the influence of a sister whilst growing up. Where two of them had much older female siblings, they acknowledged that their sister played little or no part in their life during their childhood. That is, they were either estranged, or their sister had already moved out of home.
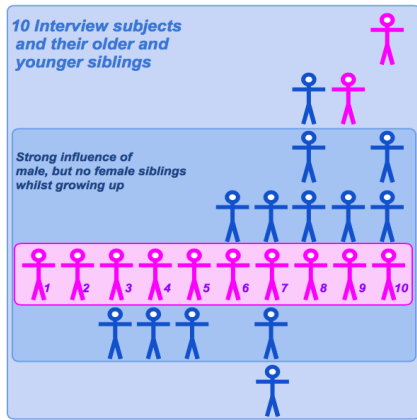
Figure 2 - Birth order and influence of interviewee's siblings

4.1.3 Parents' education & influence on career
Just over half of the respondents have parents who come from a science or research background, with more than one-third having PhDs. Not that their fathers suggested they work in digital games, but the fact that almost all respondents admitted to loving *science* and *technical subjects* in high school, is undoubtedly due to their father's influence, and understandable that they eventually pursued game development at university. Similarly, those women who came from single-parent families stated that their mother was their role model and their 'most staunch supporter' (AIA2) who shaped them into the person they are today. Despite friends and extended relatives having misgivings about their career choice, respondents overwhelmingly said that they had the support and backing of their parents when they entered the DGI.

'I recall my uncle asking whether there's any money in it. I think that is the main thing most people think about… it's a young person's game [and so] it's hard to imagine someone in their 40's still making games' (SIJ1).

4.2 Participation at University
All ten of the interview subjects have at least one tertiary qualification (some several), and all of them related to their job in the digital games industry. This is not unusual for women in the Australian DGI as every single one of the 35 respondents of the *Aussie Women Game Developers Survey* have tertiary qualifications, and 31 of them specifically related to game development. Half of the respondents majored in programming at university, with the remainder concentrating on Game design, Game Art and Testing, though the programmers also considered themselves creative, saying they like to dabble in graphics as well as code. Similarly, half of the artists said that they program – but just that they consider themselves '*pretty rubbish at it*' (AIA2) even though they don't mind programming. Despite enjoying programming at university, many of the women commented on how as a programmer they were not taken seriously by their male peers, as they were not as fast, yet later on when they started work they had no problems at all with co-workers. This harkens back to claims that male students believe that speed, rather than quality of code, is a measure of ability [37].

4.2.1 Low participation at University
Most respondents commented how in their first year there were anywhere up to 15-20% of females in their classes (higher in non-

programming subjects), yet by the time they were in their final year they were the only one left. Three of the respondents mentioned that before finally settling on enrolling in a game development degree and eventually graduating, that they had previously enrolled in university straight out of school, but had subsequently dropped out. At the time, they put it down to a number of factors, including, *not fitting in***,** *feeling overwhelmed* and *not being able to keep up* or *get the help they required***,** and that *classes were not being taught in a way that they could grasp.* Perhaps more so, they felt they were too young to start university at that time and were *unable to cope or combine their studies with other commitments***.** Within two years though, they had re-enrolled and eventually graduated with Distinction (75+) averages. They put it down to '*just not being confident at the time'*. It is by no coincidence then that, each one of these factors was also mentioned in Roberts [44]. A prominent and recurring issue that almost every female seemed to experience at university was males challenging them and undermining them if they were put in charge of a team. Some women seem to believe that for '*weaker'* females, this could contribute to why some other women dropped out. When the researcher asked why they chose not to dropout themselves, they said that it was easier to *step aside* or *take a backseat* – they were used to '*sucking it up and just getting on with the work instead of fighting'.*

'I was put in charge of a team. I had a problem with one of the guys who refused to take on-board anything I had to say… In the end, I backed down and got someone else to take over the lead. They still implemented everything as I had planned, but I didn't have the aggravation of playing politics. Afterwards he treated me fine. We get on okay now' (SIJ1)

'The older guys didn't like having a girl telling them what to do' (SOM3)

'When I was lead, I was questioned more… It was frustrating like it was ingrained subconsciously for people to challenge my every decision. In the end I stepped down because it was too stressful. I still had control of my work but wasn't as scrutinised as much' (KSS2)

'One guy was particularly strong and had a lot of influence with the others… It took him 14 weeks before he said I was doing a good job and realised he was wrong. Now he sings my praises' (AIA2)

4.2.2 Teaching style
A higher than expected number of respondents attended the *Academy of Interactive Entertainment (AIE)*, a college, which has campuses in Sydney, Melbourne, and Canberra. All remarked how much they enjoyed their course and the way it was taught. They enrolled with the understanding that it was '*not as competitive'* as a university course, but provided more *face-to-face time with fellow students engaged in group-work,* with *more one-on-one time with teachers who were around when they needed help*. This type of learning environment aligns with findings from a recent Australian study [45], where it was reported that 'small group activities provide students with opportunities to undertake more active learning, addressing the boredom issue' [46]. It also 'reduces the likelihood of students feeling disconnected from the teaching and learning environment, and makes it easier for them to ask for support when they need it' [44]. Conversely, those who completed their degree at a traditional university complained about how *working with guys was frustrating*, as team-mates would never meet up outside of class times to do group work assignments and leave everything until the last minute. They mentioned how they wished there was more 'enforced' class time to work on projects together.

'Once classes were over, guys in your team never wanted to stay back and work on our games, they would just take off and you wouldn't see them until 10 minutes before the next class. SO infuriating!' (GAA2)

4.3 Working in a digital games studio

4.3.1 Perceived stereotypical game industry culture

Despite Australia's apparent ties culturally with the US, it appears though, at least in the workplace, that many of the issues reported in articles, such as the 'hostile work environment' [49] and how women are treated, were not among concerns raised by any of the ten respondents. That's not to say that it doesn't happen as Trauth [53] said, women might just become inured to such behavior. Perhaps though it may be due to the way Australians view work, or because of the more stringent workplace laws, that these problems are not evident within the Australian DGI.

'I don't think women are treated any differently. It is not something I have come across. We all just want to get our work done' (MAM3)

'I've never personally experienced any sexism or harassment. Some guys though are awkward and can make inappropriate comments or worse, apologise every time, which makes me remember I'm a girl. Like when I first started they would make a big deal about having to 'hide' the porn drive. But really it's not an issue, it happens outside of work too' (HMC3)

4.3.2 Workplace conditions

Only two of the women have children, and both started their families after entering the ADGI, and took a break between jobs. The other eight women are single with no children. Having a partner who is understanding of the demands of the industry is important and every one of them claim that they either met their partner through gaming or programming. Most said that the thought of marriage, family, and kids is a long way off, so issues such as workplace conditions did not appear to be on their radar when they applied for their jobs, though most said conditions where they currently work are good.

'There's a lot of family support, so if I need time off to attend to family stuff, they're fine with it. At the moment I'm only working 4 days [a week] for the moment, but I can ramp back up' (MAM3)

This has not always been so. Between 2009-11, half of the women were working for AAA companies and all reflected back to things being *'not so nice'* during what one referred to as a *'tumultuous time'* in the industry. Just before the GFC hit there was so much work around and not enough skilled workers that studios were forced to recruit from overseas. One industry veteran commented how when their studio was so much smaller, it was more fun, more intimate and family-like. However, when the company she worked for grew to over one hundred staff in a very short time, the whole dynamic changed, and it became more like an impersonal factory churning out games.

'I was working 16-hour days for months on end then the project was cancelled. It was so deflating. All accrued overtime in lieu was lost. That is, we were all screwed. Things have changed a lot since then' (SOM3)

'Crunch time was the norm, almost every day - not the exception an there was no overtime… Time off in lieu was meant to be in place, however they would discourage you even thinking about taking time off' (KAL2)

'I worked 7 days a week for 2 years back in 2009. Basically crunch caused the demise of the place. That was years ago' (SON4)

A major factor that contributed to the researcher having to undertake the four-phase approach, was to re-locate a whole new group of women to interview after the original group that had been identified back in 2010 had either headed overseas to work in more conducive surroundings, or left the industry altogether.

'I quit out of disgust' (KAL2)

'It's one of the reasons why I started my own business. If I'm going to be working 12-hr days I don't want it lining someone else's pockets' (SOM3)

'[Having my own company] we set realistic deadlines and pretty much try to stop work before dinner and not work beyond that' (SON4)

Over the past three years though, the landscape of the ADGI has changed. Where once working conditions were far from acceptable, nowadays work is 'more fun and less crunch' with women happy to report that they usually work 9 to 5, and if they do work back later, then it is because they want to - not because it is expected.

'Occasionally there'll be something urgent the next day that needs completing the night before. But it's not as if it happens every day, or for weeks or months on end like it used to' (MAM3).

On the bright side, women were quite happy overall with their jobs. The number one perk is, '*getting to work on really cool games* [and] *getting to work with cool, like-minded people who have the same end-goal… we probably share more common interests [with co-workers] than in other jobs*'.

4.3.3 Pay Disparity

Apart from those women who own their own game companies for whom, in the beginning, like most fledgling businesses, try not to pull a 'proper wage', the topic of pay disparity between work colleagues did not seem to be an issue that any of the women brought up. It is either not a problem, or just not on their radar. Similarly, mentioning of the 'glass ceiling' also brought no response. Perhaps this is because in smaller studios in Australia there is less of a hierarchy, and promotions and remuneration is understood not to be a priority. There was mention however, 2-3 years back, several AAA studios were being accused of exploiting junior staff who were '*being treated like cannon-fodder' towards the end of a project, where these young and inexperienced staff (both male and female) were expected to be willing to work ridiculous hours*' - up to 80 hours a week for minimum wages and no overtime. This no longer appears to be happening in 2013.

4.3.4 It's not a proper career

Even though the skills required to work as a digital games developer are similar to that of an IT professional, the perception that many people have is that it is not a *real job* [47]. Thankfully, most of the women reported that they have received a lot of support from their immediate family for their career choice; however, some parents and many 'outsiders' still see working in the ADGI as a short-term, risky career move.

'Gaming is not seen as practical and is not considered a 'serious' job at least as far as my parents are concerned. Still, they never tried talking me out of it' (HMC3)

5. CONCLUSION

This research addresses gaps in local literature on the Australian DGI, by presenting data collected through surveys and interviews on Australian women game developers. The findings revealed a range of influences. While participation is low, preliminary figures from data collected from the census undertaken during this research indicate that the percentage of women in the Australian digital games industry has actually increased over the past year. This is not due to any changes that specifically affect women, but rather, because of the recent growth in the industry with many new smaller indie studios. Whilst perceptions of work culture stereotypes persist overseas, this does not appear to be the case for women working within the ADGI. Similarly, inflexible workplace conditions, pay disparity, and long working hours are also not compelling women to leave the industry. The 'pipeline issue' appears though to be the primary obstacle in getting women interested in game development. Factors that inhibit women from choosing to enroll are attributed to a lack of interest because the tertiary teaching environment does not suit women's collaborative and more social learning styles. Similarly, being a minority in a

male-dominated environment, a significant issue contributing to women dropping out is the way male students treat female classmates in their first-year, which may stem from a lack of confidence coming straight out of high school. Fortunately, this does not persist into industry, but the damage is already done. von Hellens claims that many women are socialized into the game industry culture, by developing coping strategies in an attempt to fit into this male domain [55]. This may be true to a certain degree, but it seems more plausible that women who choose to pursue a career in the ADGI are actually a unique breed, 'a specific type of woman', who is predisposed to eventually want to work in games. Trauth [53] maintains that women who pursue IT are 'powerful people: forthright, strong, driven, ambitious, mathematical, less social than other women, logical and competitive'. Similarly, women who choose to be game developers, also have their own set of unique characteristics. Despite coming from very diverse locations, age groups, schooling and socio-economic backgrounds, from a young age Aussie women game developers possess very similar personal traits, abilities, and interests. Furthermore, they also share the influence of strong parents. Most importantly though, they were introduced to playing games during their childhood by a male relative, which may have eventually aligned them with the digital game development culture.

6. REFERENCES

[1] #1reasonwhy: the hashtag that exposed games industry sexism: 2012. *http://www.theguardian.com/technology/gamesblog/2012/nov /28/games-industry-sexism-on-twitter*. Accessed: 2012-11-29.

[2] 8515.0 - Digital Game Development Services, Australia, 2006-07: 2008. *http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/85 15.02006-07?OpenDocument*. Accessed: 2013-09-29.

[3] 8679.0 - Film, Television and Digital Games, Australia, 2011-12: 2013. *http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/86 79.02011-12?OpenDocument*. Accessed: 2013-08-22.

[4] Acker, J. 1998. The future of "gender and organizations": connections and boundaries. *Gender, Work and Organization*. 5, 4 (1998), 195–206.

[5] Adya, M. and Kaiser, K.M. 2005. Early determinants of women in the IT workforce: a model of girls' career choices. *Information Technology & People*. 18, 3 (2005), 230–259.

[6] Allen, T.J. and Corp, N. 2006. The Passion of the Developer : ea _ spouse in the h _ ouse ! A panel on labor relations and quality of life in the industry. *Sandbox Symposium 2006*, (Boston, Massachusetts, 2006), 29–40.

[7] Australian Government 2013. *Information and communications technology workforce study*.

[8] Australian Government 2013. *Women in male-dominated industries*.

[9] Australian Research Council Centre of Excellence 2011. *Working in Australia's Digital Games Industry*.

[10] Bayliss, J. and Bierre, K. 2008. Game design and development students: who are they? *International conference on Game development in Computer Science* (New York, New York, USA, 2008), 6–10.

[11] Carmichael, G. 2008. Girls, computer science, and games. *ACM SIGCSE Bulletin*. 40, 4 (Nov. 2008), 107–110.

[12] Cassell, J. and Jenkins, H. 1998. From Barbie to Mortal Kombat: Gender and Computer Games. *From Barbie to Mortal Kombat gender and computer games*. H.J. J. Cassel, ed. MIT Press. 2–45.

[13] Chao, S. 2010. *Factors contributing to the underrepresentation of female undergraduates in computer science in Australia*.

[14] Clayton, K.L. et al. 2009. Gender stereotypes prevail in ICT: a research review. *SIGMIS-CPR '09* (Limerick, Ireland, 2009), 153–158.

[15] Computer game industry looks to women for fresh insights: 2007. *http://www.computerworld.com/s/article/293317/Computer_ game_industry_looks_to_women_for_fresh_insights?pageNu mber=1*. Accessed: 2013-10-01.

[16] Consalvo, M. 2008. Crunched by passion: women game developers and workplace challenges. *Beyond Barbie and Mortal Kombat : new perspectives on gender and gaming*. J.Y. Kafai, Y.B. Heeter, C. Denner, J. Sun, ed. MIT Press. 177–191.

[17] Damsel in Distress (Part 3) Tropes vs Women | Feminist Frequency: 2013. *http://www.feministfrequency.com/2013/08/damsel-in-distress-part-3-tropes-vs-women/*. Accessed: 2013-10-21.

[18] Denner, J. et al. 2005. Girls creating games: Challenging existing assumptions about game content. *DiGRA 2005 Conference: Changing Views - Worlds in play* (Vancouver, BC, 2005).

[19] El-Nasr, M.S. et al. 2007. Middle-to-High School Girls as Game Designers–What are the Implications? *Academic Days '07*. (2007), 54–58.

[20] Enderton, M. 2003. *Women in Computer Science. Two Studies on the Effects of Stereotypes*.

[21] Fat, Ugly, or Slutty: Where Online Gaming Harassment Meets Its Match: 2012. *http://broadrecognition.com/politics/fat-ugly-or-slutty-where-online-gaming-harassment-meets-its-match/*. Accessed: 2013-11-13.

[22] Female Game Programmers Tell Horrible Stories Of Harassment: 2013. *http://www.businessinsider.com.au/women-programmers-stories-of-harassment-2013-3*. Accessed: 2013-03-13.

[23] Fullerton, T. et al. 2008. Getting girls in the game: toward a "virtuous circle." *Beyond Barbie and Mortal Kombat : new perspectives on gender and gaming*. Y.B. Kafai et al., eds. MIT Press. 161–176.

[24] Game Developer Magazine 2013. *The 12th Annual GD magazine Salary Survey*.

[25] Game Developers' Association of Australia: 2008. *http://gdaa.com.au/about*. Accessed: 2013-09-20.

[26] Gamers petition for sacking of GameSpot writer who criticised GTAV for misogyny: 2013. *http://www.mcvuk.com/news/read/gamers-petition-for-sacking-of-gamespot-writer-who-criticised-gtav-for-misogyny/0121238*. Accessed: 2013-09-19.

[27] Games! Girls! Onions!: 2013. *http://www.dead-reckon.com/post/60762312852/games-girls-onions*. Accessed: 2013-10-31.

[28] GDC: We Need More Women in Games: 2009. *http://www.edge-online.com/features/gdc-we-need-more-women-games/*. Accessed: 2010-03-10.

[29] Geneve, A. et al. 2008. Passion, women and the games industry: influences on women's participation in the Australian digital content industry. *Women in games conference* (Warwick University, UK, 2008).

[30] Geneve, A. 2013. *Women's participation in the Australian digital content industry*. Queensland University of Technology.

[31] Gourdin, A. 2005. Game developer demographics: An exploration of workforce diversity. *Mt. Royal, New Jersey: International Game Developers Association* (2005).

[32] Graner-Ray, S. 2003. *Gender inclusive game design expanding the market*. Charles River Media.

[33] Haines, L. 2004. *Why are there so few women in games?*

[34] Holden, M. and Lynch, P. 2004. *Choosing the Appropriate Methodology : Understanding Research Philosophy*.

[35] IGDA to investigate Team Bondi allegations | GamesIndustry International: 2011. *http://www.gamesindustry.biz/articles/2011-06-28-igda-to-investigate-team-bondi-allegations*.

[36] Imagine .... More female developers: 2007. *http://blogs.theage.com.au/screenplay/archives//008241.html?page=2#>*. Accessed: 2013-09-29.

[37] Irani, L. 2004. Understanding gender and confidence in CS course culture. *ACM SIGCSE Bulletin* (Mar. 2004), 195.

[38] Kafai, Y.B. et al. 2008. *Beyond Barbie and Mortal Kombat : new perspectives on gender and gaming*. MIT Press.

[39] Kerr, A. 2002. Representing users in the design of digital games. *… Games and Digital Cultures Conference Proceedings* (Tampere, 2002), 30.

[40] Lee, N. 2006. Beyond Barbie and Mortal Kombat : new perspectives on gender and gaming. *Computers in Entertainment*. Y.B. Kafai et al., eds. MIT Press, Cambridge.

[41] Mannis, V.S. 1999. Single Mothers by Choice. *Family Relations*. 48, 2 (Apr. 1999), 121.

[42] Nordicity 2013. *Canada's Video Game Industry in 2013 Final Report*. Entertainment Software Association of Canada.

[43] Prescott, J. and Bogg, J. 2013. The Computer Games Industry : New Industry, Same old Issues. *Gendered Occupational Differences in Science, Engineering, and Technology Careers*. 64–77.

[44] Roberts, M.R.H. et al. 2012. Attrition from Australian ICT degrees: why women leave. *Proceedings of the Fourteenth Australasian Computing Education Conference (ACE2012)* (Melbourne, Victoria, 2012), 15–24.

[45] Roberts, M.R.H. et al. 2011. What Students are Telling us about Why They Left Their ICT Course. *Innovation in Teaching and Learning in Information and Computer Sciences*. 10, 3 (Nov. 2011), 68–83.

[46] Schweitzer, D. and Brown, W. 2007. Interactive Visualization for the Active Learning Classroom. *SIGCSE '07* (2007), 208–212.

[47] So, lots of people want to work in the Video Game industry: 2013. *http://forums.penny-arcade.com/discussion/176597/so-lots-of-people-want-to-work-in-the-video-game-industry-help*. Accessed: 2013-09-30.

[48] Tapia, A.H. et al. 2007. Building Virtual Spaces: Games as Gatekeepers for the IT Workforce. *International Federation for Information Processing*. 236, (2007), 317–334.

[49] Tapia, A.H. 2006. Hostile Work Environment.com: Increasing participation of underrepresented groups, Lessons learned from the Dot-Com Era. *Advances in Information Systems*. 37, 4 (2006), 79–98.

[50] Taylor, D.M. 2013. *Honours thesis: Female game developers in the Australian digital games industry*. University of Technology, Sydney. *http://hdl.handle.net/10453/24148* Accessed: 2014-01-28

[51] The 2013 Game Developer Gender Wage Gap: 2013. *http://borderhouseblog.com/?p=10567*.

[52] To Boycott PAX Or Not To Boycott PAX?: 2013. *http://www.rockpapershotgun.com/2013/09/19/to-boycott-pax-or-not-to-boycott-pax/*. Accessed: 2013-11-13.

[53] Trauth, E.M. 2002. Odd girl out: an individual differences perspective on women in the IT profession. *Information Technology & People*. 15, 2 (2002), 98–118.

[54] Trauth, E.M. et al. 2004. Understanding the under representation of women in IT: toward a theory of individual differences. *2004 ACM SIGMIS conference on computer personnel research: Careers, culture, and ethics in a networked environment* (Tucson, AZ, USA, 2004), 114–119.

[55] VonHellens, L.A. et al. 2001. Breaking and entering the male domain. Women in the IT industry. *Proceedings of the 2001 ACM …* (San Diego, CA, USA, 2001), 116–120.

[56] Why are there so few lady game creators: 2012. *https://twitter.com/Burning_Luke/status/273121518362439680*. Accessed: 2012-11-30.

[57] Why It Sucks to Be a Woman in the Video Game Industry: 2012. *http://www.motherjones.com/mixed-media/2012/11/women-video-game-industry-twitter-1reasonwhy*. Accessed: 2013-09-29.

[58] Women fight back on video game misogyny: 2013. *http://thegazette.com/2013/08/19/women-fight-back-on-video-game-misogyny/*. Accessed: 2013-08-19.

[59] Women in Games: Rebalancing The Scales: 2013. *http://www.gamesindustry.biz/articles/2013-09-30-women-in-games-rebalancing-the-scales*. Accessed: 2013-10-10.

[60] Women left on sidelines of video game revolution - Los Angeles Times: 2008. *http://articles.latimes.com/2008/oct/21/business/fi-gameswomen21*. Accessed: 2013-11-15.

[61] Women remain outsiders in video game industry - Business - The Boston Globe: 2013. *http://www.bostonglobe.com/business/2013/01/27/women-remain-outsiders-video-game-industry/275JKqy3rFylT7TxgPmO3K/story.html*. Accessed: 2013-11-10.

[62] You don't want to work in the video game industry: 2009. *www.bruceongames.com/2009/11/12/you-?dont-?want-?to-?work-?in-?the-?video-?game-?industry/*. Accessed: 2013-11-15.