

Hacking at the techno-feminist frontier – Gendered exclusion and inclusion in informal technology events. Aphra Kerr and Joshua Savage, Department of Sociology, Maynooth University. [pre-print version – comments welcome]

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The knowledge economy developed in the late 1960s in the United States when academics began to notice that the value of knowledge-based occupations and industries to the overall economy had overtaken that of manufacturing and the extractive industries (Kerr and Ó Riain). Ireland's knowledge economy developed somewhat later, but the importance of knowledge-based industries and occupations to our contemporary economy conforms to western industrial trends in many ways. Information and communication technologies (ICTs) are a core enabler of knowledge-based industries, and in many ICT companies today the most highly sought after (and highly paid) roles are often in programming. Computer programmers produce formal and professionally certified forms of knowledge in technical languages to deliver services. Other forms of knowledge are often less valued in financial and social terms. So-called 'soft skills', design skills and contextual knowledge are often constructed as feminine, even if they are critical to the ultimate success of many technical and creative projects (Preston et al.). Two key features of computer programmers stand out: their status in contemporary society, and their gender.

As Walby points out, the gender composition of the knowledge economy varies depending on which sector you focus on. However, the more the industry is based on technology, the more gendered masculine it is. This pattern is replicated in Ireland: a recent publication found that the female share of employment in the computer software industries in Ireland fell between 1991 and 2006 (Russell et al.). This occurred during a period when women's participation in the labour force more generally grew, women's educational attainment at third level exceeded that of men, and the share of women's employment in some previously male-dominated occupations like commerce and science increased. Further, less than 16% of professors in STEM-related positions in higher education institutions in Ireland by 2015 were women (O'Connor et al.). This poses key questions for policy makers and researchers: Why is computer programming as an occupation and as an object of study dominated by men? What are the implications of this pattern for technical knowledge and the design and use of technology in the knowledge society?

For almost two decades, state- and industry-funded education and media initiatives in Ireland have attempted to increase the number of youth entering Science, Technology, Engineering and Maths (STEM). The approach taken mostly involves a range of promotion and awareness-raising activities aimed at children, parents and teachers. Science and technology competitions abound, and television programmes partly funded by Science Foundation Ireland have proliferated, e.g. RTE's 'the Science Squad'. A number of these activities have specifically targeted girls and women. For example, the annual I-Wish conferences in Cork and Dublin are fronted by high-profile female scientists and engineers. Their aim is to influence the subject choices of 14–17-year-old teenage girls. Another set of promotional initiatives have mobilised digital games as a means of attracting young people to events where attendees learn to programme. CoderDojo, for example, involves volunteers from the IT industry teaching children as young as 7 years how to programme simple applications, often games. These events take place at weekends in a variety of settings, from companies to universities. The volunteers organise the events and often share what is produced online. While these events are open to everyone, their role, efficacy and social impact is rarely critically examined, especially from a gender perspective.

In this chapter we examine how informal education events, like gamejams, contribute to the gendered structure of the knowledge economy in Ireland. We identify how communication, temporal and spatial structure, hierarchies of knowledge and unpaid labour contribute to gendered knowledge hierarchies, and to gendered pathways into ICT related occupations. Game making and game playing events may reinforce a relationship between codified and abstract forms of knowledge, certain forms of masculinity, and computers, ultimately undermining the assumption that digital games provide an equal pathway into STEM for all. Even if the focus of these events is on learning technical skills, we would suggest that a range of 'informal' and 'incidental' social learning is taking place that may serve to reinforce wider patterns of social inequality. In what follows, we first place our work in the context of historical and feminist research into the gender/technology/knowledge relationship in production and consumption cultures. We then present our findings from research at two day-long gamejam events in Ireland in 2016 to identify who attends these events and the ways in which these events are gendered. Finally, we discuss how academics and civic society organisations have collaborated to organise inclusive female-friendly informal learning events. These events are inspired by the techno-feminist approach of Judy Wajcman ("Feminist Theories of Technology"; *Techno Feminism*). They aim to challenge the association between

hegemonic masculinity, men and technology which is often found (implicitly or explicitly) in informal and formal educational settings. They explicitly sought to promote knowledge diversity, gender equality and inclusion in the digital games community in Ireland.

The mutual shaping of gender and technology

Promotional activities aimed at diversifying the workforce within the computing and games industry often fail to take account of the long history of women's systematic marginalisation from technologies, and to examine how existing structures and cultures may discourage diversity. Histories of technology have identified that the marginalisation of women in the technical sciences and industries has had a profound impact on the design of technologies, which in turn has contributed to the gendering of the everyday cultures of use surrounding these technologies. Histories of the design of fridges, ovens, televisions and telephones have identified the implicit and explicit gendered assumptions embedded in the technologies, and the impact these assumptions have on cultures of use (Cowan; Grint and Gill). In many instances domestic technologies were designed by men to be used by women in the home. The sale and marketing of white (kitchen) goods versus black (entertainment) goods, as well as cultures of maintenance and repair, often reproduced existing gendered stereotypes and relations of power in the home.

The development of the personal computer, the internet and a range of associated information and communication technologies (ICTs) held out the promise that the association of masculinity, mastery and expertise with technology might be broken. Here was a technology that did not require strength to operate. The first computer programmer was a woman – Ada Lovelace. Women dominated in the early history of computers when computing was seen as an extension of typing and secretarial work, and female human computers could be legally paid less than men for the same work. Some early feminist writing on women and technology saw technology as opposed to femininity and sought to reject it (see Wajcman *Techno Feminism* for a discussion). Cyberfeminists in the 1990s lauded the potential for gender fluidity in online spaces and for new forms of socio-technical and hybrid human/machines. Yet the optimism was short lived and challenged by empirical studies. Gendered patterns of design, marketing and use have continued with media technologies and increasingly with children's leisure technologies. Gendered social and cultural practices continue to shape educational and occupational choices, including pathways into computing and software programming. The

knowledge economy and the gender composition of technology-based occupations has become dominated by men.

Years of public and private initiatives in Western countries to promote computing and technology as a career to young people have been met with static, and in some cases declining, numbers of women studying STEM subjects, particularly computer science (Kafai et al.:5). Occupational segregation based on sex persists in computer programming and related jobs in the West, as evidenced by the data on Ireland (Russell et al.). Those women who do work in high technology industries are likely to leave mid-career citing workplace culture, work/life balance issues and sexism as factors. Following Wajcman (2004) we can identify this as a liberal approach, and in what follows we suggest that this approach is insufficient to tackle diversity issues in technological industries, workplaces and cultures. The liberal approach leaves existing structures in the workplace, entertainment cultures and wider event culture intact and rarely questions the design of technologies. As Sandra Harding (:18) has noted, there is a relationship between gendered occupational structures, gender symbolism and gender identity – things that are gendered female are often attributed lower status and lower pay.

An alternative to the liberal approach can be found in techno-feminism. Wajcman ("Feminist Theories of Technology") notes that techno-feminism is concerned with both understanding gender power relations and intervening to change the cultures and practices surrounding the design of technological artefacts (including technological knowledge). Inspired by socialist feminism, techno-feminism combines insights from within science and technology studies (STS) and one strand within feminism to argue that gender and technology are mutually shaping – technology is both a source and a consequence of gender relations. A key insight is that while technology is not fixed, neither is gender: both are subject to, and part of, a wider set of contingent and changeable social relations. An additional consideration is that the construction and design of technologies requires a range of knowledge, skills and expertise. Lay or 'vernacular' knowledge is increasingly acknowledged as a key source of innovation in technology cultures. Yet differences in technical expertise are often perceived as gendered (Jenson and de Castell). In the IT industries expert, codified and statistical forms of knowledge bring more reputational status and financial advantages. Thus, the production of both technical knowledge and material technologies is deeply entwined with gender, race and class distinctions in contemporary technological cultures. Techno-feminism provides a useful approach from which to question the relationship between gender and technical knowledge and

prompts us to explore how social codes shape computer code, and vice versa. It also argues that there is scope for intervention and change.

We can bring the techno-feminist approach, and insights from previous studies of the relationship between technology and gender, into our analysis of the digital games sub-sector and, in particular, informal educational events focussed on digital games. Current research has found that the digital games industry, game content and online and offline gaming cultures are highly gendered. The industry in the US, the UK and Ireland has one of the lowest percentage rates of female employment of all media and ICT industries (hovering around 10%), and in programming occupations it is even lower (Kerr *Global Games. Production, Circulation and Policy in the Networked Age*). The percentage of workers from non-white racial and ethnic backgrounds is lower still. Research on the digital games industry in Ireland has found the highest paying programming jobs dominated by men; women more commonly occupy business operations and 'below the line' community management jobs (Kerr and Cawley; Kerr and Kelleher). Working conditions are often poor with 'crunch' working hours of 60-80 hours not uncommon in the run up to deadlines (Consalvo). Recruitment into the industry is highly reliant on informal networks and a mix of cultural and social capital.

The association between games and heteronormative masculinity is often reinforced by the industry in its marketing, advertising and content, which can be highly stereotyped and explicitly targets boys, teens and young men. Attempts in the 1980s to target women with pink boxes and Barbie-related games are emblematic of a highly essentialised approach to gender (Cassell and Jenkins). Research has critiqued the colour stereotyping of game packaging, highly sexualised female avatars in games, and a range of gendered practices in the increasingly professionalised e-sports field that associates heteronormative masculinity with excellence in competitive gameplay (Taylor et al.). Core to the 'gamer identity' is knowledge of the history of games, who makes games, and of the particular techniques and language of games. Those without this knowledge are called 'newbies', and this lack of insider knowledge is often associated with women (Shaw). However, when digital game play is studied empirically over time, gendered patterns of game play, gender preferences and expertise are less marked by sex than often assumed (Kerr "Girls Just Want to Have Fun"). There are female identified high-level players and some women enjoy violent and fast paced action games. Public gaming events, from gaming parties to game nights in internet cafes, are primarily attended by men and increasingly adopt the language of highly masculine sporting events. Women, when present, are largely in supportive or decorative roles. Recent work on gender and digital games have

attempted to incorporate a more intersectional approach, exploring race, class and different forms of masculinity in digital game play (Kafai et al.).

Professional games industry associations largely adopt a liberal approach to addressing this lack of diversity, establishing special committees for 'Women in Games' which showcase women already working in the industry and running conferences and seminars for networking. The underlying assumption is that if women and girls have more knowledge of the industry and what it does, they will want to work in it. The problem is often conceptualised as a 'pipeline problem' which can be solved by increasing the numbers of women entering the industry. However, Quality of Life surveys of the industry have identified persistent sexism in the workplace, and research indicates that there is a 'leaky pipeline' when it comes to women and ethnic minorities. Such initiatives have succeeded in raising awareness of gender issues, but they have done little to change the numbers of women studying or making digital games or to move discussions of gender in a more intersectional direction. As critiques of gendered and misogynistic representations, structures and cultures over the past twenty years by activist and feminist game designers and researchers grew, a significant backlash has emerged, particularly in the US.

Indeed, 'backlash' as a word understates the persistent online and offline harassment and threats made to some women who question the dominant culture and the representation of women and minorities in the industry and its products (Chess and Shaw). The ire focussed partly on attempts to make game characters and stories more representative, to make game characters less sexualised, and to introduce community management standards into online cultures and codes of conduct to public events. If game cultures were seen as inaccessible to many women before the online event that became known as #gamergate, they were seen as downright hostile to their presence in the aftermath (Mortensen). Gender is therefore a significant and fraught issue in digital games, and it is a marker of inequality in terms of access, status and content that operates at numerous levels. Given that some surveys state that almost 50% of 'people who play games' are women (ESA), it is likely that many female gamers have encountered hostility as part of their online cultural experience. The differential gaming and technology experiences of many women must be the starting point for any interventions attempting to tackle persistent gender inequalities in accessing highly paid computer, games or programming jobs. This is even more important given that some of the digital services developed by these companies produce, control and shape our access to knowledge.

Gamejams as Informal Technology Learning Events

Little attention has been paid to exploring the role that informal learning events play in relation to reproducing gendered structures in knowledge economies. Informal learning events are ephemeral by their nature and much of the organisational work and promotion takes place online. They are organised through websites and social media, and take place in a range of borrowed spaces - from rooms in pubs to university computer labs and innovation spaces. They usually take place in the evenings or at weekends. Hackathons and Gamejams are two types of informal learning events which focus on computer and game programming. Hackathons and gamejams are predicated on the belief that everyone can programme, and that collaborative coding can be empowering. They have their origins in the emancipatory politics of hacking and in the open software movement. Gamejams in particular have their origins in the independent music scene (i.e. jamming) and the culture of hacking into computers. Gamejams are promoted as spaces for social networking and do-it-yourself (DIY) game making events. However, histories of hacking and gaming cultures have also found that they are dominated by men and are often hostile to women (Jordan and Taylor). Studies of hackathons in the US have found that they replicate the individualist, competitive, temporally intense, and deadline-driven workplace cultures of the software and technology industries. Many 'hackathons' are underpinned by an explicit neo-liberal belief that everyone can be a technology entrepreneur (Irani), and a more implicit belief that the perfect neo-liberal subject is continually striving to upgrade their technical knowledge and skills. Hackathons and game jams are marketed as 'open to all' but this ignores the existence of gendered economic, social and cultural barriers to access and the ways in which the design of these events may exclude.

Gamejams are defined as 'accelerated' and 'constrained' forms of collaborative game-making (Kultima, 2015). Attendees must design a game in a pre-defined length of time on a theme that is announced at the start of the day. Research on gamejams would suggest that they are a useful way to motivate people to learn content, technical and collaborative skills (Kultima; Locke et al.). This research has also identified that gamejams are organised by a variety of organisations including the games and technology industry, universities and schools, and small-scale independent developers. At the same time, gender dynamics and gendered knowledge systems may come into conflict in mixed informal learning environments like after-school clubs and gamejams (Jenson et al.). Diane Carr researched an after-school club in London. She noted how game preferences and competencies developed over time for both girls and boys but that boys and girls coming from certain backgrounds often have a broader range

of pre-existing skills and competencies. Informal experience with computer technologies provides some children with a greater advantage when entering both formal and informal education, and digital games may provide not only computing experience but also confidence with problem solving, managing failure, and basic programming. It may also contribute to the early formation of a computing or IT identity, and an interest in related occupations (Hayes). Gamejams, then, are one type of informal learning events where learning, gender and technology are mutually shaped, but where prior knowledge and social capital play an important role.

Dublin is home to a flourishing scene of informal technology learning events, from meet ups and hackathons to gamejams. They are usually organised by volunteers from academia or the IT industry, but increasingly they are used by research centres, technology festivals and companies for public engagement. They promote the ‘coolness’ of technology work, technological upskilling, and are an important informal marketing and recruitment tool. They are intrinsically linked to online and offline social networks, with many organised through websites. On the website ‘meetup.com’ there were almost 250 registered ‘tech’ interest groups for the Dublin area, and five of these groups had over 1,000 members. Other social networks for technology and games related events include Facebook and designated channels on sites like ‘Discord’. These groups are less formalised than traditional clubs, rarely requiring paid membership or other forms of commitment. It is sufficient to sign up online, paying with your data. Some are international associations with an Irish ‘chapter’, while others are Dublin only. Some of these events explicitly target women or girls (e.g., PyLadies, Girl Geeks, Women Who Code Dublin, Ladies who UX), but most are promoted as events that are open to all. A recent study of a female coding event in Ireland found that it had a range of competing goals and frictions involving commercialism, entrepreneurialism, recruitment, knowledge hierarchies and gender differences (Maalsen and Perng; Perng et al.).

GameCraft is a bottom up, Irish only, volunteer-run gamejam with the tagline ‘Connect, Create, Collaborate’ (see <https://www.GameCraft.it/>). It was established in 2012 by a female programmer and is still predominantly organised by a (different) woman. It is a registered not-for-profit organisation and runs 4–8 events on average each year. GameCraft can be defined as an ‘independently’ run gamejam. Its website states that “GameCraft is a games jam event designed around building the gaming community. We aim to create events which allow game-makers to meet, share ideas, have fun, compete for prizes and most importantly make games!” The goal of GameCraft is to design a playable game in 10-12 hours. Our knowledge of

GameCraft goes back to 2013, and one of the authors has observed their events over a number of years. Attendees form small teams with others who have complementary skills and then work together all day to develop a game. These teams may be composed of individuals who knew one another before starting the event, individuals who just met at the event itself, or some combination of the two. GameCraft events often charge little or no admission fee (often <€10 to cover lunch and soft drinks) and attendees must be 18 years of age or older. Attendance can range from 20–120 people and the website states that no prior game design experience is required. In addition to digital games, GameCraft also encourages the design and development of non-digital games, such as board games or card games, and provides materials for producing them. GameCraft has been invited to organise events in London, New York, Paris and Vienna but over the past six years most of their events have taken place in Dublin, Cork, Galway and Limerick in Ireland.

In 2016 the authors formally started to conduct observation and surveys of GameCraft. Our project sought to explore how independently organised gamejams like GameCraft might contribute to, or challenge, the gendering of the wider games industry and culture. This research was conducted within the auspices of the ‘Refiguring Innovation in Digital Games’ project funded by the Social Sciences and Humanities Canadian Research Council (see <http://www.refig.ca/>). The starting premise of that project is that game cultures and the games industry are highly gendered and we need to explicitly map these gendering processes and encourage interventions for change in the industry, in formal and informal education, and in online communities. Our methodology was mixed-method and in this chapter we largely draw upon surveys of attendees at two GameCrafts and our fieldnotes. We also provide some initial insights into three game design workshops that we designed as interventions; but these interventions were still ongoing at the time of writing.

Between January and March of 2016, one GameCraft event was held in the Dublin Institute of Technology in Dublin, and another in the University of Limerick, Limerick. Both were held at weekends from 9 a.m. to 9 p.m. We approached the organisers of GameCraft to ask permission to survey their participants and to gain access to their documentation, including their code of conduct. Both authors attended. The Dublin event was held in a refurbished church on a university campus, while the Limerick event was held in a social area of a university building. People brought along their own computers and shared communal desks. Snacks and lunch were provided, with pizza and soft drinks at the end of the day. Each event culminated in a play session. Attendees were asked to judge the games and award small prizes. Of the total

attendees at the two events (n=53), 27, or 51%, completed the online survey. Research staff were available to answer questions, and the survey itself had four sections: Gamejam Experience; Game Making Knowledge and Experience; Diversity and Discrimination, and Demographics. Our results largely confirmed our observations: most respondents at the GameCraft events identified as male (77% in Dublin and 93% in Limerick), white (92% in Dublin and 93% in Limerick), and straight (77% in Dublin and 93% in Limerick). Respondents in Dublin were fairly evenly distributed between different age groups, while attendees in Limerick were primarily aged 18–24. 38% of attendees at Dublin were studying at least part time, while 43% of attendees at Limerick were doing so. Of those that were not, most were working at least part time, and most were already working in some part of the IT industry.

So this ‘open to all’ event, which had sought to attract males and females with no game design experience, attracted mostly males who were already studying or working in programming and the IT industry. Indeed, a majority of attendees at both events were programmers (85% in Dublin, 57% in Limerick), and when asked most respondents said they were attending in order to improve game-making skills (92% in Dublin and 93% in Limerick) and to meet others in the Irish games making community (92% in Dublin and 64% in Limerick). The results are consistent with findings from similar events, such as the international Global Game Jam (GGJ). A 2013 survey of GGJ participants found that participants were 86% male, 56.5% were aged 21–29 years and 60% had a college or degree level qualification (Fowler et al.). GameCraft was attracting those with existing programming and IT skills and enabling them to further develop their skills and to build a social network that may be useful in future recruitment. These events were succeeding at being social networking events at which attendees could improve their social networks and hear about employment and other opportunities. They were also primarily attracting and benefitting young males with pre-existing IT knowledge and social and cultural capital. How did GameCraft manage to attract such a narrow set of attendees with such a singular set of skills? In the next section we explore four findings in more depth, drawing upon our survey and fieldnotes: communication and recruitment for the events; the temporal and spatial structure of the events; the hierarchies of knowledge and identities that are validated throughout the day; and the invisible labour that people invest in such events.

Exploring the Reproduction of Gendered Forms of Exclusion and Knowledge Hierarchies

GameCrafts are advertised on the GameCraft website, other gaming websites, and social media. One might think that open advertising on social media and websites would attract a diverse set of attendees. However, our survey found that the most effective form of communication about the event (for almost 60%) was ‘word of mouth’, followed by gaming accounts on twitter and some gaming websites. This sharing on gaming-related online media restricted the range of people reached, and the word-of-mouth sharing of information meant that many people were arriving with friends and pre-established teams. These findings suggest that the communication channels and messages employed by GameCraft were very successful at attracting young males who specialise in programming and are already interested in games, but were not so successful in attracting or reaching outside gaming communities and pre-existing social networks. The forms of communication used to recruit also impacted team formation at the events. While collaboration in teams is at the core of the event, there seemed to be little attempt by attendees or organisers to diversify the range of skills in teams. Some teams were already working on college projects together or were in college together. Later in the year we attended another GameCraft and on this occasion only two of the 52 participants were without a team at the start of the day.

Other temporal elements in the structure of GameCraft are noteworthy and influence who can attend. One of the events we attended took place on Valentine’s Day. This provoked much joking that attendees must all be single if they were free to attend on that day. Regardless of this fact, a 12-hour event presupposes that participants have 12 hours of free time at the weekend to participate in this type of event. They are free from caring and other responsibilities. The following table gives the running order of one of the events we attended. While 12 hours might seem long to some readers, this was a short gamejam compared to others. The annual Global Game Jam for example runs over a 48-hour period and attendees often sleep at the venues, or not at all. These events are designed for those who can sit at a table - for up to 12 or 48 hours. The events often represent a very long working day at the end of a working week or study week for most attendees. Such events replicate the intense working conditions experienced in deadline driven creative, gaming or IT projects.

<p>Breakdown of the day</p> <p>08:30 Registration 09:00 Introduction 09:10 Game jam starts 13:00 lunch 19:00 Game jam ends, start playing games, voting 20:45 Award winners 21:00 End</p> <p>Here's how it works:</p> <ul style="list-style-type: none"> • You have twelve hours to make a game. Starting at 9am <ul style="list-style-type: none"> • The theme will be advertised during breakfast • Work on your own or with a team. You can form a team on the day if you like <ul style="list-style-type: none"> • Use whatever platform or framework you like • Judges review and vote on the games <ul style="list-style-type: none"> • Prizes.
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Table 1: Schedule of a GameCraft. Source: <https://www.gamecraft.it/>

A key aspect of a gamejam is that the organisers announce a theme in the morning and all projects should relate in some way to that theme. It is usually an abstract concept like 'borders' or 'love'. At GameCraft, once 10 hours of development is over a bell goes and everyone plays each other's games and eats pizza. Attendees vote on the best games and small prizes are awarded. Most prizes are sponsored by companies. While the competition was low key at the events we attended, the voting was also influenced by the pre-existing social networks and friendships of those attending.

The event website states that no game making experience is required to attend and according to our survey learning new skills is a key motivation for attendees. However, we observed that the pre-existing knowledge of attendees is important and those who attended primarily had very good levels of computer, game and IT literacy. In a 12-hour period there is not sufficient time to learn new software and to develop complex graphics, animations or interaction for a game. While the goals of the event are to include everyone, and all skillsets, the strict deadline meant that access to programming knowledge was key to finishing a game, or at least getting a game to work. The pleasure of getting a game 'to work' was evident. Getting things to 'work' is often a euphemism for programming something to move and respond to the player on screen. These two events were dominated by those with programming and computing skills, and those who were already embedded in the educational or occupation culture of computing and IT. This was exacerbated by the tendency for these events to be held on

university or college campuses with the support of computing and games lecturing staff. Many attendees self-identified as gamers on our survey and were interested in making and releasing a digital game. Indeed, three participants had already developed and launched a game on an online application store. The requirement to get things to work in a ‘constrained’ 12-hour period on an unannounced theme reinforces the need for programming skills and introduces a semi-public competitive aspect to these events.

Another important aspect of the design of these events is that participants must bring their own equipment. Participants bring along their own laptops, ancillary hardware and in some cases virtual reality headsets. It should be noted that gaming computers are amongst the most expensive computers (up to €4,000) given their need for high end graphics cards and computing power. Some participants showed off their new laptops, or a piece of open source software that others might not know about. Others sat with large headphones on. To us researchers these technology requirements (in terms of cost and knowledge) were clearly a barrier to participation. GameCraft organisers provide crafting materials to make non-digital games but we observed little engagement with these, only one person designed a non-digital game over the two events we observed.

Finally, we wish to reflect on the forms of labour involved in running and attending GameCraft. These gamejams relied upon significant unpaid labour by female volunteers, with support from mostly male full-time academics and industry representatives. The (largely unseen) organisational and communication work of the events relies heavily on volunteer labour. While the advisory board for GameCraft involves both men and women, the current key organiser is a long-time unpaid organiser of GameCrafts and female-friendly programming events. Her educational background is in programming and, with an MA-level qualification, she is highly qualified in IT, gaming and event organisation. She takes care of the technical, catering and organisational structure of the events and takes care of the well-being of attendees on the day. She is also the person people report any misconduct to. This role involves a large degree of face-to-face affective labour, a core element of many contemporary service industries (Kennedy). More free labour and technical knowledge are embodied in the free and open source software used to advertise the event, run the sign-up process and post the games after the event.

Another aspect of the free labour embodied in these events is the ‘aspirational’ labour (Duffy) of the attendees. Many of the attendees are students or working in IT who hope to enter the games industry and have given up their leisure time to learn new skills and build their

social networks. The rise of unpaid labour is widespread in the contemporary knowledge economy and reveals additional gendered knowledge patterns. In the online world of beauty bloggers and YouTube celebrities, we find the aspirational labour of primarily female content creators who believe that their “unpaid work, motivated by passion and the infectious rhetoric of entrepreneurialism, will eventually yield respectable income and rewarding careers” (Duffy, 2017:15). We find another version of this entanglement of aspiration and gender in the “passionate labour” of mostly male gamers keen to enter the games industry (Kerr and Kelleher). GameCraft and similar types of informal technology learning events enable those with the social and cultural capital, and the free time, to invest in upgrading their technical knowledge. It trains them to work in an intense deadline-driven culture. Most participants are willing to sit for 12 hours powered by copious amounts of tea, coffee, soft drinks and cigarettes. In the large open-plan spaces participants circulate to survey the work of others. Everyone can observe the performance of technical expertise, or its absence, in such a space, seeing who produced a working game in these 12-hour marathons. GameCraft makes visible and public the aspirational labour and passion of mostly men, while making less visible the organisational labour of mostly women behind the event. Our findings resonate with research on gamejam events in the UK (see Kennedy, 2018).

While open to all, these events are not attended by all. Despite the best efforts of community volunteers, in our view these events demonstrate how the association between games, IT knowledge, and masculinity, gets reinforced and reproduced. Wider gender and knowledge hierarchies are actively shaping who has the time and resources to attend these events, and these intersect with class, race and ethnicity. Locating the events in universities, technology companies or innovation hubs provides informal knowledge of these venues and companies. Locating events at universities and colleges means that the attendance is skewed by those already attending university technology courses, which are themselves already heavily male dominated. We returned to observe a third GameCraft in Dublin in Dec. 2017 and a fourth in Cork in March 2019. Little had changed in terms of participation. These events further reinforce social networks and social capital for those who can attend, giving attendees a ‘head start’ in game-related recruitment as part of the insider culture. Sponsors provide free t-shirts, stickers, company information and in some cases information on jobs. While GameCraft succeeds in providing social networking and collaborative learning opportunities for attendees, the design of these types of informal learning events, and the necessity for them to partner with others to find suitable venues, means that they are shaped by pre-existing gendered structures

of production and reproduction. These types of events implicitly exclude those who do not conform to these structures – for example, those with caring responsibilities or atypical work, and those without IT skills, hardware and gaming knowledge. Further, the time intensity of these events further reinforce a hierarchy of knowledge which places abstract coding and programming knowledge at the top of the hierarchy. Further work is required to establish if our findings hold for other information technology events and if ‘open to everyone’ events are in fact contributing to reinforcing the gendered digital divide in the wider IT industries.

Gender-based discrimination and Techno-feminist interventions for change.

During our field research a number of events raised the issue of diversity in public discourse in Ireland. This included the 2015 same sex referendum, the 2016 #wakingthefeminists movement in Irish theatre, and the 2017 international #meto movement. These events were preceded by the #gamergate event which started in 2014 and saw a number of American and European academics and female game designers subject to an online backlash from game players and some industry spokespersons. The backlash sought to “protect” digital games from attempts to increase diversity, especially in relation to gender and sexuality. It is within this context that we situate our discussion of the findings from our survey on diversity, experiences of discrimination and our own interventions in local game culture.

Our survey asked participants about diversity at local game events. Overwhelmingly respondents felt that events were not diverse, and of those who answered the follow up question many felt that women, people over 30, and “non-Irish” people were missing. Despite this finding many respondents were unconvinced that local game events should explicitly address diversity issues. We also asked had attendees observed, or experienced, discrimination in game cultures - 44% responded that they had. While the survey population here is small, and our attendees were primarily male and young, the level of observed discrimination is quite high. This result may be partly explained by response bias, as the participants may have been primed to think about discrimination, but the discrepancy is notable not only for the amount of reported discrimination but also for its type: while in national surveys the most common grounds for discrimination are age and race/ethnicity (CSO), in our survey of GameCraft participants it was gender. We based our list of possible forms of discrimination on Irish national surveys. This level of gender-based discrimination is in line with international studies of the prevalence of gender-based discrimination in online and offline game cultures.

It is clear from our surveyed gamejams that they do not attract a diverse crowd and attendees notice this. Further, attendees also either experience, or observe, gender based discrimination in wider games culture. While some attendees were ambivalent about addressing this, the Refiguring Innovation in Games (ReFIG) project sought not only to identify gendered structures and practices, but also to design interventions to change local gaming and IT cultures. Many of our partners were running female-only after-school clubs, female-only incubation centres, and female-only gamejams (Kennedy). The New York based ‘alterconf’ ran an inclusive technology conference in Dublin in 2016 (see <https://www.alterconf.com/>). Their approach sought to run technology events for all marginalised people. Such an approach goes beyond codes of conduct and embraces a policy on bathrooms, venues and event content. Our local collaborator already ran “female-friendly” events, which encouraged heterosexual, queer and trans individuals, couples and allies to attend. In our planning discussions we felt that female-friendly events would be more open to gender-queer, trans and non-cis individuals than women only. All of these individuals may be marginalised by existing informal technology events.

In our intervention we wanted to embrace a feminist and intersectional pedagogy which sought to create safe spaces for alternative forms of knowledge and marginalised groups. In collaboration with local partners we designed three half-day workshops which sought to address the exclusion mechanisms we identified in GameCraft in terms of: communication and recruitment, access to hardware and software, cost, duration of events, venues, knowledge diversity and free organisational labour. We publicised these workshops across a range of creative and non-gaming websites, networks and organisations in an attempt to reach beyond existing game networks and to attract a range of artistic, creative and non-technical skills and knowledge. To promote accessibility to all groups, we did not charge an admission fee, and we provided all materials and computers. We highlighted our Code of Conduct in the application process, emphasising standards of behaviour that would be expected of all attendees and providing clear avenues for reporting problematic experiences (see also <http://www.refig.ca/safer-space-policy/> and www.gamedevelopers.ie/diversity/). Any complaints were only acted on if the attendees wished for action to be taken, a provision intended to allow attendees to feel that they maintained agency over the process.

In the summer of 2016 we ran three beginner and female friendly free workshops on successive weekends in Dublin city, with 30 attendees. Our attendees were predominantly female (100% of attendees at the first event, 70% at the second, and 64% at the third) and older

than what was observed at the Dublin GameCraft events; the 18–24 age group that was dominant at GameCraft made up only a small percentage of attendees at the Network in Play workshops, if at all (0% at the first session, 10% at the second, 14% at the third). The 25–34 age group was the most common at our events, and even the 45–64 age group was represented at each event (14% at the first session, 20% at the second, and 7% at the third). Some who attended were unemployed. However, people of colour were notably absent, as with the GameCrafts we observed. Feedback on the exit surveys from our first three workshops was very positive and one stated that they “loved the day, very warm and welcoming”.

From the surveys we noted that advertising our event on non-gaming channels was very successful; many who attended had first learned of the event through its advertisement on mailing lists for visual and creative artists. This was reflected in the skill mix of attendees, which was more diverse than at GameCraft. Attendees included jewellery makers, painters, animators, and graphic designers, in addition to those with programming skills. Positive word of mouth meant that the numbers of attendees increased over the three workshops. Our attention to using inclusive language in recruitment also appeared to be successful. The code of conduct and the language used during the workshops were also met positively. Many expressed interest in attending more events.

We purposely designed a half-day rather than a full-day event to address time commitment issues. Some attendees had to leave early, while others asked for longer sessions. Access challenges remained, however: potential attendees identified childcare, parking and the locations of the event space as significant barriers. In terms of pre-existing knowledge, we worked closely with our tutors to ensure they were aware of our goals and we included a range of commercial and non-commercial, digital and non-digital games as examples, which also included a diverse range of representations and avatars. Collaboration was encouraged; competition was not: there were no prizes, deadlines or ticking clocks. Finally, the tutors, organisers and research assistants were paid for their time and expertise. While the attendees were investing their aspirational labour the organisers were more visible and paid.

Our workshops focussed on the fundamentals of game design, game narratives and game programming. The workshops that we designed moved from non-technical in the first workshop to the use of computer hardware and software in the second and third. The more technical workshops introduced significant material challenges in terms of hardware, software and knowledge requirements. Partnering with educational institutions to gain access to

computer labs inevitably means that the technologies that they provide are high-end computers and may have non-standard software. In one of our 2016 workshops this introduced challenges for our tutors and attendees. However, by far the most complex challenge involved designing an introduction to game coding for beginners. Attendees at this workshop were 50:50 male and female with a majority working full time. The feedback from attendees was very positive. Attendees commented on the “friendly tutors” and that the events were “an absolute pleasure to be part of”. At the same time this workshop required two tutors rather than one, more supports from the organisers, and introduced a technological barrier – people needed their own laptops. Also we had a much higher demand from males to attend the third workshop and we had to turn away some male attendees in order to keep a mixture of attendees.

In 2018 we brought our three beginner and female friendly game making workshops to another Irish city. We recruited 33 people and a majority of females to our workshops over three weekends. Yet again however a majority of attendees were already either working or in full time study, and two were following game related courses. In an attempt to overcome the necessity for attendees to have a computer for our coding workshop we used a technology training centre. Unfortunately, this was not entirely successful. The computer laboratories were arranged to facilitate individualised rather than collaborative learning, and most of the computers were locked down to prevent their being moved. The computers were not fast enough to run even the basic games tutorials and the projector was not of sufficient quality to display the software. Our tutor was an experienced developer, but struggled to design an introductory session for beginners. Despite the best efforts of tutors and organisers significant techno-spatial hurdles prevailed. Feedback was mixed – with non-beginners frustrated with the slow speed of the computers and session, and beginners frustrated with the fast pace. Some beginners wanted paper handouts to supplement the online material.

On reflection we, as organisers, learnt a lot from this final game coding workshop. While we succeeded in diversifying participants at our workshops, and created inclusive teaching resources, we realised that this is only the first step in challenging gendered pathways. The hardware, software and venues we used restricted our pedagogical freedom - challenges faced by many students entering formal computing or gaming education. Training software is pre-coded with significant assumptions about prior IT knowledge and an unsettling requirement for our workshop to sign up for an account with the key industry software provider in order to download their educational software. This experience raised some important questions about

where and how to teach game coding to beginners – and the ways in which software can co-opt our learning experiences into the wider knowledge economy.

Crafting inclusive learning spaces and challenging exclusion mechanisms.

Gamejams are just one type of informal technology event which are being used to promote STEM occupations and educational choices. On the basis of our research we need to question the assumptions that these events are ‘open to all’. This chapter has mapped some of the gendered structures which operate to exclude many from attending. Our research would suggest that these events rely on narrow communication and social networks for promotion, their temporal and spatial structure presuppose able bodied and available leisure time, and they require access to computing resources. These structures contribute to the attendance being dominated by young males and by those already studying and working in IT related industries. Furthermore, the semi-public performance of technical knowledge at these gamejams often comes at the expense of other forms of knowledge needed to innovate creatively. We also need to highlight these events’ reliance on volunteer and aspirational labour. These types of events risk further entrenching the feminisation of behind-the-scenes, invisible and unrewarded labour while foregrounding a competitive, masculinist, deadline-driven technology identity and working culture. Attendance at these events further reinforces the social and cultural capital required to get a head start in the IT industries and may be contributing to the reproduction of wider gendered structures and hierarchies in our knowledge economy.

Many of our surveyed attendees were aware of the lack of diversity at game events. One solution might be to organise women-only events. In our experience ‘women only’ events can also be problematic, depending on one’s goals. Maalsen and Perng found that women only events encounter resistance from the broader computing community, who argue that they are discriminatory. We encountered those who perceived the problem of diversity as being with those who do not turn up. Our experience organising our female friendly workshops indicates that we can remove some of the exclusionary and masculinist elements and create events that are attractive to a diverse range of people (while acknowledging that there were still some groups that we were not able to reach, such as non-white and non-straight individuals). We can produce safe informal spaces of learning aimed at opening up the range of skills needed to produce a digital game. Our project highlights the importance of organisational innovation to create inclusive learning spaces and the importance of having supportive intermediaries (researchers, tutors and technologies etc.) to foster an inclusive pedagogy.

At the same time technology barriers persisted. We found that we needed to decode the affordances built into our computer laboratories, our hardware and our software tools if we are truly to hack the technology/gender relationship. The lessons of techno-feminism are that while ‘technology affords or inhibits the doing of particular gender power relations, the relationship is not ‘immutable fixed’ (Wajcman 2010:150). Gender and artefacts that seem obdurate can be reprogrammed. Our biggest challenge was access to a space and computer resources on an ad hoc basis that did not presuppose pre-existing computing, gaming and IT knowledge. Some computing technologies are unsuitable for beginners. Some formal educational spaces come with a built in expert-centred pedagogy. Many presuppose fully abled bodies. Our focus remains on the potential of informal learning, supportive networks and both digital and non-digital technologies to rethink the mutual shaping of gender, technology and games. Our project’s goal is not to ‘attract’ more marginalised people into the technology pipeline as many diversity projects attempt to do. We do not wish to bring more women and marginalised groups into companies whose cultural and workplace norms are based on highly gendered values and practices? As in other domains the simple presence of more women will not in itself change gendered norms and structures. The goal must be to empower women and other marginalised groups to re-code gender power relations and challenge the relationship between masculinity, knowledge and technology. This is imperative given the ubiquity of computing technologies, and the status and power of those working in the IT industries in contemporary Irish society.

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