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Final Year Research Project

The Employment of Play

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<u>Abstract</u>

The following study looks at how play is instrumentalized within the digital culture of today. Looking specifically at competitive computer coding competitions this research sought to understand the internal relations between play, education, and employment and access how these relations interact with each other. By researching people who are involved with running these events and participants who compete in these competitions it is hoped that this might add to the study of games and play, and how they are intimately intertwined with the shaping of our social and cultural word. The key findings of this research are that within the new digital culture that is shaping contemporary society, play is being instrumentalized in competitive computer coding competitions. This has resulted in the creation of a functional junction where the employment of educational strategies meets the employee and the employer.

Introduction

This research seeks to investigate how competitive computer coding competitions instrumentalize play. The research looks at the rise of popularity of using the competitive aspect of play to teach and perfect skills of people who work with programming languages in the field of science and technology. I chose this topic because, the idea of using play to compete against people for the benefit of the jobs and skills market seemed to me the opposite of what play ought to be. The research was carried out using semi-structured participant observation at a competitive computer programming event. Additionally, six semi-structured interviews were carried out which included three people who are involved in working with these competitions, and three people who have competed in them. Previous studies have looked at the instrumentalization of play in regards online digital games, but I have not found literature specifically on the instrumentalization of play in competitive computer coding competitions. I found a previous study on coding events known as *Game Jams*; however this did not access these non-competitive coding events through games and play theory. The themes that this study wishes to explore are:

- Are competitive coding competitions as a form of play?
- How is play changed and rationalized by these competitions?
- Do the participants enjoy entering them?
- Is it the capitalist class that will ultimately benefit from such skill?

In studying this topic difficulties were found in recruiting female participants to interview. This is due to what Wajcman (2008) called the gendering of technoscience, where women's participation is not encouraged by educational institutions, which still choose to socialize women into traditional roles within the labor market. In relation to my intended research goal which sought to understand how competitive computer coding competitions instrumentalize play, there emerged a strong connection to competitive coding competitions for use as a social learning environment.

1. <u>Literature Review</u>

Theodore Adorno & Max Horkeimer's (1993:31) theory of the "culture industry" represents the grip capitalism has on society, which is suppressing culture in the name of profit margins. It is the result of the most dominant industries in society supporting each other; producing commodities for a culture they are simultaneously creating (Adorno & Horkeimer 1993). In this way, the leading media, music, and movie companies lean on the financial industry to mass produce news, films, and smash hits; thus, saturating culture so much that it has convinced people that it is producing exactly what they want (Adorno & Horkeimer 1993). "Something is produced for all, so that none may escape" (Adorno & Horkeimer 1993:32). In reality, the culture industry is cold and analytical; its products measured and produced into specific formulations, by companies that talent scout for the perfect ingredient to success (Adorno & Horkeimer 1993). This rationalised mass production of the cultural industry has "standardized" culture, because what is produced is devoid of any artistic "technique", leaving the only technique involved that of "one of distribution, and mechanical reproduction" (Adorno & Rabinbach 1974:14).

Alternatively, Antonio Gramsci offers a theory of "hegemony", which presents a different perspective of society and culture highlighting the ways it can be changed (Simon 1999: 25). Hegemony represents the relation that exists between classes and the additional forces within society, and which is manipulated by "coercion and persuasion", thus vital for class domination (Simon 1999:25). For example, the political class utilizes force through the legality of the state, while also using persuasion to support their ideologies, by appealing to the "common sense", (or, the "uncritical" approval), of civil society (Simon 1999:29). However, Gramsci suggests there is room to maneuver for civil society, found among the

relations between classes, capitalist entities, and other organizations with national interests (Simon 1999). Civil society is not simply fated to a life of coercion from the political society, if it can sway relations of the other social forces in the direction of its demands. The key to succeeding in this rests within the sphere of the civil society, with whom Gramsci (1992:6) calls "the intellectuals", for these are the people who form the relations between social groups. There are two kinds of intellectuals, "traditional" and "organic", the former being passive, not striving for political change, while the latter is active and involved in political sphere (Gramsci 1992:3). Organic intellectuals are not necessarily directly involved in state politics and can hold any position in society, but what distinguishes them is that they express the ideologies, and hopes of the class they represent (Gransci 1992). They can strive for the demands of the civil society and gain some control of the social system (Gramsci 1992). It is vital for the ruling class to maintain dominance over the intellectuals, using persuasion against passive intellectuals, and legal force against organic intellectuals, if they attempt to overthrow the system (Gramsci 1992).

The common consensus of a society changes over time as the "cultural traditions" change from one "epoch" to another (Gramsci 1992:78).

In the 1960's post war era, the United States military researched the use of computers to form a communication network (Streeter 2011). From this research emerged what was termed "the mother of all demos", which saw Douglas Engelbart, demonstrate to an audience of enthusiastic computer scientists his new creation (Streeter 2011: 40). This

creation consisted of "network computers using graphical, windowed interfaces and computer mice to collaborate remotely across a computer network" (Streeter 2011: 40-41). In other words, this was the first demonstration of an intranet, including the hardware and software used to access it which we still use today. However it wasn't until the 1980's when neoliberalism met what is known as the "Californian Ideology", both of which were influenced by technology; that the digital culture we see today was made possible (Streeter 2011, Nagle 2015). Meaning, the neoliberal ideology believed that technology would see far greater advancements if the government deregulated the markets, allowing privatized companies to subsume the role of government agencies such as "Federal Aviation administration […] government-funded research, or protected, regulated monopoly corporations" (Streeter 2011:73). While at the same time in California, "Steven Jobs, Steven Wozniak and Armas Clifford" were developing the "Apple II microcomputer", which was about to be marketed to the world (Streeter 2011: 69). Barbrook and Cameron (1996) point out that what lay behind the Californian ideology was the theory of Marshall Mcluhan that "the medium is the message". McLuhan suggests different mediums can be seen as "extensions" of the human senses for example, radio extends hearing, and print media extends visual senses (Mcluhan 1964). This idea fuelled the entrepreneurship of Silicon Valley who saw technology as an opportunity to create a brand new extension of human consciousness.

> "Influenced by the theories of Marshall McLuhan, these technophiliacs thought that the convergence of media, computing and telecommunications would inevitably create the electronic agora - a virtual place where everyone would be able to express their opinions without fear of censorship" (Barbrook and Cameron 1996).

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It is worth interjecting here that computer programming and coding were in existence long before the Californian ideology of the 1980's and that the role of women was crucial to the development of technology, but in particular "computer programming" (Wajcman 1991:29). This is often ignored within the field of science and technology, which many feminist authors, such as Judy Wajcman seek to highlight. The reasons for this lack of acknowledgment can be historically traced back to unequal rights for women, for example Wajcman (1991:28), cites Griffiths (1985), who highlights that up until the late 1800's women had no legal right to own personal property within marriage, thus they could lay no claim to any project they were involved in. Additional inequality in education also saw women banned from entering certain fields of study such as "theoretical […] mathematics and mechanics".

Despite this, woman such as "Ada Lovelace, and Grace Hopper," were pioneers in the creation of logical computer programming (Wajcman: 1991: 29). Lovelace worked with "Charles Babbage", who conceptualized a programmable machine that could analyze data fed to it (Charman-Anderson 2009). In 1842 Babbage requested Lovelace to translate an Italian article that described how the machine worked (Charman-Anderson 2009). Her completed work contains three times the amount of information than the article she was translating, includes accurate and original descriptions of the potential the machine has, plus "contains several early computer programs" (Charman-Anderson 2009). Thus Lovelace can be seen as a pioneer "computer programmer" (Charman-Anderson 2009). Additionally, Howard 2015) points out that during WWII up to "10,000 people", were involved in "the

Bletchley Park codebreaking operation", set up to decipher coded Nazi intelligence. Approximately 7,500 of these people were women, yet acknowledgment of their work is often overshadowed by the patriarchal structures that surrounded them (Howard 2015). Even today however, the participation of women in computer science is low, partly due to the continued "socialization" of women, into stereotypical roles by educational structures, and party because the realm of technoscience is gendered male, because women are not represented in the "design and innovation" phases of projects (Wajcman 2008).

Getting back to the synthesis between neoliberalism and the *California Ideology* in the 1980's, what was created is seen within contemporary society as a relatively new cultural dimension known as the "digital culture" (Sismondo 2010: 100). Computer coding is becoming the new subject taught in different schools across countries in Europe, encouraged by the European Union, who additionally have allocated 80 million euro for start-up programs in this area (Nordicom 2014). In Germany, computer programming has started to be introduced into the education curriculum of second level schools, while in Estonia; programming is beginning to be taught in primary schools, to six year old children (Nordicom 2014). Users of computer hardware and software are being encouraged to learn how to code the devices, and programs that have come to be a part of their lives (Nordicom 2014). In Ireland also, children are encouraged to start learning computer programming form a young age, for example, the Irish company "Coderdojo" describes itself as a Global network of free volunteer-led, independent, community based programming clubs for young people […] 7 and 17 (Coderdojo.com). With so much emphasis being put on the importance of individuals being able to code software, it is not surprising that MacKenzie (2006) suggests that software itself has started to resemble society. For Mackenzie (2006),

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like the characteristics of contemporary society, software is a structured object that is utilized by the capitalist class for production, is also a means of communicating, and has economics and politics embedded within it.

The digital culture is affecting more and more aspects of society every day. In 2011 a report was drafted called the *National Strategy for Higher Education to 2030*, which recommended the trajectory education in Ireland should take in the coming years (Department of Education and Skills 2011). It suggested, "to address the societal needs over the coming years, increased attention must be paid to core skills such as quantitative reasoning, critical thinking, communication skills, team-working skills and the effective use of information technology" (Department of Education and Skills 2011: 35). Holborow (2012: 93) suggests that what this amounts to is a neoliberal ideology which seeks to create "human capital", which only sees human potential as a commodity that is useful for the capitalist class. She suggests that such a strategy only satisfies two primary concerns of capitalism, first, workers with tailored skills perfect for potential employers, and second, "competition between individuals in the labor market" (Holborow 2012: 93). However in the midst of the economic recession which Ireland finds itself, Holborow (2012) suggests that this strategy will fail in its attempts to undermine the role of higher education as just a recruitment agency for corporations. This will become evident, she believes, as time passes while the recession will not.

So far it has been shown how the ideologies of politics, capitalism, and individual entrepreneurs have created the digital culture, and in turn is influencing society through

hegemony. There is however another factor which influences society and culture which has

not been looked at namely; play. Huizinga (1949) looks at the different elements of play

that exist in all cultures throughout history, creating and shaping social life in different ways.

Play he suggests, influences rituals, poetry, music, dance, philosophy, art, law, and even

warfare (Huizinga 1949). Additionally, play also has a social meaning in that a society's

culture unfolds through playfulness, therefore he term humans; *Homo Ludens,* 'man the

player' (Huizinga 1949). Thus play, like culture is a creative language and a "voluntary

activity", in where people freely abandon reality to enter a new structural realm that is

different from everyday life (Huizinga 1949: 7-10). This realm has two key themes which

influences the form play takes, namely, "contest for something, or representation, [or

exhibition] of something" (Huizinga 1949: 13). Additionally, both forms can combine where

play exhibits aspects of a contest, or a context forms around the best presentation of

something (Huizinga 1949: 13).

Also highlighting the influence of play on humanities destiny, Sutton-Smith (1997), suggests

that no one theory of play can pinpoint a defining aspect of an action which can be both

passive and lively, historically rooted in every part of the world, and is performed by all

sentient beings. Thus he presents seven aspects of play that are worth bearing in mind

when researching the realm of play. These are, *progress*, *fate, power, identity, Imaginary,*

Self, and Frivolity, which in the same order, translates play into these forms; *play/games,*

chance, Skill/strategy, Festival/Parades, Fantasy, leisure vs. Extreme games, and finally

nonsense (Sutton-Smith, 1997:215). The author goes on to suggest that play has a similar

dynamism to the early cognitive development of a child, with the shared traits of

spontaneous self centeredness and idealised confidence. In this way he suggests play is

similar to a language that takes its origins from the survival instinct, which "mimics or mocks the uncertainties and risks" of nature, as a sort of initiation for the body and mind (Sutton-Smith 1997). In other words, the seven aspects of play can teach us personal real life skills that relate to development, destiny, influence, individuality, inventiveness, character and just pure light-heartedness.

Mcluhan (1964), who was seen earlier as being the influence to the Californian Ideology that created the digital culture today, also recognized the cultural importance of games. A theory in a similar vein to Sutton-Smith (1997), Mcluhan (1964), describes games as "extensions of social man and the body politic". In the same way art is not simply playing with paint, but an extension of human consciousness, likewise, games not only transform the mundane and allow people to forget the stresses of societal life, but also are an extension of the social and political aspects of human culture (McLuhan 1964). Games represent our psychology through artificial situations people create, which in turn represent specific patterns of life in a community (McLuhan 1964). In this way, he suggests poker represents the highly individualized, competitive side of society, where cleverness, hostility and deceit have become the modes of survival. On the other hand, the multirole aspect of American football players, point to a different dimension of society, where teamwork is utilized to function more productively (McLuhan 1964). Therefore he sees games as the "social reactions to the main drive or action of any culture" (McLuhan 1964:235).

Games and play therefore, are an important factor for both influencing our own abilities in society, and gaining knowledge of what larger cultural force is operating behind it. Looking at play and games in today's culture then, should highlight what skills people are learning,

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and pinpoint the main driving force behind it. Grimes and Feenburg (2014) suggest that in the contemporary world, play has become rationalized, in the light of the overall rationalization of society in general, which occurred through modernity and was fuelled by capitalism. The authors are focusing on online digital gaming; however as a general theory it might be worth bearing some elements in mind. They suggest that play in the modern capitalist world has become "rationalized", in that play is being transformed into a rationalized ordered system similar to what is seen in "capitalist markets and bureaucratic organizations" (Grimes and Feenberg 2009:105). They propose a similar play theory to Huizinga's, that when a person engages in play, they enter a sphere that is separate from everyday life activity. However, in today's world, play "becomes rationalized through the technological mediation and widespread standardization that occurs as games become large scale social practices" (Grimes and Feenberg 2009:105). In other words, games become confined to a set paradigm which is restricted by technology and the boundaries that surround it. They term this rationalization of play "Ludification". Consequently, what occurs is the "instrumentalization" of play, meaning the aspect of play is changed, and influenced by "social, cultural and political forces" that get factored into the technology and software producing the game (Grimes and Feenberg 2009: 106). Which means for example, looking to Huizinga's (1949) idea that play is about abandoning the real world for the realm of play, instead what is happening with the instrumentalization of play, the structures of the real world creates its own rationalized form of play.

Another form of play that exists in the digital culture is what is known as a computer coding event, where people gather to create games or other software using their coding skills. Describing one form of these coding events known as "game jam", Shin, Kaneko, Matsui,

et.al, (2012: 117) describe the event as a space where people get together to create, and release a digital game as quickly as possible, but without a competitive element. Originating in 2002, the first game jam was previewed at the Game Developers' Conference the same year (Shin, Kaneko, Matsui, et.al, 2012). In 2006 the International Game Developers Association, or IGDA, collaborated with Copenhagen University, and local game business and created the first major game jam, which has become the model and inspiration for the now annual global game jam (Shin, Kaneko, Matsui, et.al, 2012). This event is organized on a voluntary basis and is streamed around the world through the internet, which in 2012 saw 10,684 people partaking (Shin, Kaneko, Matsui, et.al, 2012). People participating in game jams come from diverse backgrounds, such as professional developers from the largest companies in the software industry, independent developers, academic students and amateurs (Shin, Kaneko, Matsui, et.al, 2012). Professional developers from the games industry report learning key strategies from organized games jams that help them in their professional work (Shin, Kaneko, Matsui, et.al, 2012). While organizers of the 2012 Global game jam believed all game developers, from amateurs to professional gained: "rapid prototyping experience, opportunity for failure, working in diverse teams, tools assessment and selection, research and user studies, and promotion" (Shin, Kaneko, Matsui, et.al, 2012: 20-21).

An alternative to game jams, are coding competitions, which as the name suggests do have a competitive element as a feature of the event. An example of some of these events is the Microsoft "Imagine Cup", which is a global technology competition for students (Microsoft 2015). Microsoft state, as competition participants are offered a chance to up skill their technological knowledge by competing against others, while at the same time, be included

in upcoming game development, and solve some issues in contemporary society (Microsoft 2015). If any of that doesn't entice a person there is always a chance to find new friends, and win cash and prizes (Microsoft 2015). One more example of the form a competitive coding competition can take is the IEEEXtreme 24 hour programming competition (IEEE 2015). This is a paid member's only competition that sees participants competing for 24 hours, coding live "to solve programming problems" for prizes such as new hardware and paid trips to IEEE global conferences (IEEE). Based on Grimes and Feenberg's (2009) theory that digital play is instrumentalized, the following research seeks to access whether competitive coding competitions instrumentalize play.

2. Methodology

This study sought to investigate to what end are coding competitions instrumentalized? The term instrumentalized refers to Grimes and Feenbergs (2009) theory that suggests in the over rationalization of play, the meaning of play is changed and influenced by "social, cultural and political forces" that get factored into the technology and software surrounding it. In contemporary society more and more people are being encouraged to understand how to work with programming languages. Computer programming competitions are held in IT circles where participants are required to use their coding skills, and these competitions can take a number of different forms. Sometimes participants are asked before an event to create software such as games and applications, which are presented, judged and awarded on a number of categories. Other competitions see participant's pre-code software for androids that compete against other androids at events for prizes and trophies. Another coding competition format requires people to code live to solve problems within an allocated time frame. This research was primarily interested in discovering the reasons why coding competitions are held and who ultimately benefits from having such events. Furthermore, because this research was set against the topic of games and play, an understanding of how coding competitions fit into this theme was also explored.

2.1 Research Method

This research was carried out by using a mixed method approach which combined two qualitative research methods. Using a mixed method approach helps to gain a different perspective on what is being researched, highlighting aspects of the research that may have

been hidden (O'Leary 2010). The first method was semi-structured participant observation, which Bell (1999) describes as an ethnographic style of research which allows space to share the same experience as the subjects being studied, and understand their actions in a better way (Bell 1999). Being a explanatory form of research it seeks to discover how people interact in the situation being researched; what meaning is produced, or derived from their actions, and what issues they encounter (Chambliss & Schutt 2013). The second research method utilized in this study was semi-structured Interviews, which are useful for investigating in more depth how subjects really feel and what motivates them, because a facial expression or a pause in an answer can highlight possible feeling that a survey would miss (Bell 1999). Using a semi-structured interview technique allows for "natural flow of conversations", which can often bring to light questions that were not prepared, but can be asked (O' Leary 2010).

The semi-structured participant observation was carried out on the 11th March 2015, at an Irish software coding event called the *Games Fleadh*. The aim of the observation was to gain an understanding of how the coding competition unfolds and to get a lived experience of the event. The observations focused on the general atmosphere of the competitions, the role participants played, and the experience they were having, plus the role of the technology and software industry sponsors. Field notes and photographs were taken during the observation. Four unstructured interviews were also carried out during the observation which included two people who were involved with running of the competition, and two teams who were participating in it.

Between March and April 2015, six semi-structured, face to face interviews were carried out with three people who are in involved with running competitive coding competitions in Ireland and four people who have participated in such competitions. There were two different sets of questions (see Appendix 1) based on whether an individual had participated in the competitions, or whether they were involved in organizing them. Both sets of questions were divided up into three broad themes in order to have a basic structure; however the interviews remained semi structured so as to allow for leading questions, where elaboration was needed in order to gain more insight. Additionally, the semi-structured interviews allowed the possibility of leaving out certain questions if they had been covered in the course of answering a previous question, or the interview was taking too long. The interviews were recorded to allow for a flowing conversation to occur.

2.2 Sampling

A mixture of hand-picked and snowball sampling was used in this study. Hand pick sampling allows for specific reasons to be factored into choosing participants for research, while snowball sampling allows for location of other participants, by finding one and asking them to identify others who would be suited to answer specific question (O' Leary 2010). For the semi-structured participant observation a specific type of coding event was required, that is one which included a competitive aspect to it, therefore the Games Fleadh was handpicked under this criteria. Additionally, the *Games Fleadh* is one of the biggest competitive coding events held in public in Ireland. Importantly also, the competitors of the *Games Fleadh* are third level students, who are over 18 years of age, which meant they could be freely

engaged with without the presence of a legal guardian. During the participant observation the two teams, and two organisers who were briefly questioned, were randomly selected on the day.

For the six face-to-face, semi-structured interviews that were carried out, this research again sought specific participants. Initially four informants were identified through an individual who worked in a similar environment to them. Informants are important for gathering insider expert knowledge to the area topic being studied; however one has to be aware that just because they are on the inside, it does not mean they know what's going on (O'Leary). In this research however, the informants were believed to be experts in the knowledge they had of being involved in working with competitive coding events. The four experts were emailed a request to be interviewed, at a time that was suitable for them. One of the four experts did not respond to the request to be interviewed therefore, in the end there were three experts interviewed in this study. Three competitors of coding competitions also participated in a semi-structured interview for this research. The expert who did not respond to the request to be interviewed was the gatekeeper for the first competitor interviewed, and from here, snowball sampling was applied to locate the other two participants. Some email correspondence was under taken to arrange these interviews at a time and place that best suited them. The main criteria for the expert and the competitors to be interviewed were that the former were involved with the running of competitive coding competitions, while the latter had competed in competitive coding competitions.

2.3 Ethics

This research was carried out conscientiously in regard to my position at events, and as conducting the semi-structured interviews. The Maynooth University ethical guidelines were followed during this study. O'Leary (2010) reminds us the physical, psychological and emotional welfare of participants must remain at the forefront of the research. At the beginning of my participant observation at the *Games Fleadh*, I identified myself to three organisers and informed when why I was attending. Seeking consent means that key gatekeepers to events and participants who are interviewed understand why I am conducting my research, and they will hold the power to disallow the research to continue if they feel inclined (O'Leary 2010). Similarly, before speaking to the two of the teams who competing in the competition I informed them that I was carrying out this research as part of my final year project, and received verbal consent to ask them some questions. No one under 18 years of age was asked to participate in my research. Additionally, when taking photographs during the *Games Fleadh* each shot was checked before hand and afterward to ensure no facial image of anyone less than 18 years of age was visible.

For the semi-structured interviews, I received written consent from each individual to conduct and record the interview. Confidentiality was assured in regard to participant's identification, and the safe keeping of written, or recorded data. The consent form (see Appendix 2) was signed and dated by the six participants and along with the recordings, were stored in a two secure locations with password locks. The interviews were transcribed within a week of storage, and each participant name was changed in order to secure their

anonymity. The audio recordings were deleted immediately after they were transcribed and were secured in a password protected folder in a password protected laptop.

2.4 Analysis of data

The data collected for this research consisted of 6 transcribed semi-structured interviews, (see Appendix 3, for one of these transcribed interviews), some brief field notes in a writing pad from the participant observation at the *Games Fleadh* and 12 photographs of one of the two computer coding competitions that were run at the event. The interviews and field notes were typed into a Microsoft word document of 25,000 characters in length. "Open coding" was applied to this document by reading through the interviews a number of times and picking out themes that consistently came through in the research (Bailey 2007). Next "focused coding" was applied that created broader themed categories from the multiple initial coding analysis. This created connections to themes that initially were not obvious. (Bailey 2007). These broader themes were then studied, and connections were made previous research, were passable, or left as unexpected findings if the themes were strong but were new to this study.

2.5 Limitations

The limitations of the study were the small sample size of relevant participants studied. The finding gathered from research from a small sample size, are not an accurate indication that these results are "generalizable" to trends of the wider population (O'Leary 2010). Nevertheless, this does not detract from the validity and reliability of this research, insofar as the findings represent the experience of the people who were interviewed. "Validity [is]

concerned with [the] truth value", or accurate conclusions based on the research

conducted, while "reliability" balances on "consistency" which is measured by "repeated

trials" of a study (O' Leary 2010: 62). Another limitation was the unavailability of an expert

from someone working within the CoderDojo foundation. Originally there was an interview

arranged with someone who fit this criteria, however they cancelled the interview twice,

the second time was only five minutes before the interview was rescheduled for. Therefore

to budgeting and time constraints I utilised another person in the foundation, but they were

unable to supply much relative information for the semi-structured interview.

3. <u>Research Findings</u>

Looking initially at the activity of coding in relation to play, the research revealed that the participants in this study, who are involved with coding competitions, generally think of the process of coding as a playful activity. One participant said, "I see it as play, I don't see it as work at all, this is weekend stuff, this is evening stuff, or sometimes day stuff. If I'm feeling a bit bold, i.e. not doing what I'm supposed to do for my mentor, I'll code" - (Richard PHD Student). Additionally, Dr. Lennon, who is involved with running competitions, described his own experience of coding as being, "a fun way to do stuff, it's very creative, I think a lot of people who write code are creative people". During participant observation at the Games Fleadh, one coding competition consisted of students from around Ireland creating and coding a game in the weeks leading up to the event, to which they also competed for a number of different awards. The students presented these games on laptops for the public and judges to play. Speaking briefly to two teams of four people each, from two different colleges about the process of coding the games, both teams referred to the enjoyment they got from the process. For them, working as a team and watching the creation "come to life" -(Team A), and "seeing the concept working"-(Team B) was rewarding. As far as my research revealed, all but one of the participants who were asked about their experience of coding identified it as a playful activity. The one exception Mary, (PHD student) described it as "a combination of work and play, because you have to work to get there and you have to work while you're there, but the kinda overall thing is good fun". This is not to suggest that everybody who attempts use computer coding will automatically find it playful, and both

experts, Dr. Lennon and Dr. Pearce, who are involved with running coding competitions, noted that if a person enjoys solving problems, they will see a playful element in coding.

In relation to Huizinga's (1949: 13) theory of what constitute the activity of play, the two key themes which he identified namely, "contest" and "representation" of abilities, which can individually or simultaneously influence the type of play; the coding events highlight both forms. The competitive aspect is seen in participants competing against each other, either coding live to solve the problem presented to them in real time, or pre-coding software which is later pitted against another contestant's software at an event. The *representation* of ability element, can be seen in the pre-coded coding competitions in that, the coder's ability is exhibited throughout a competition. This was seen above with teams at the *Games Fleadh* who had created a game over time, before showing their creations publically to be judged on the day. Similarly, during another event at the Games Fleadh, coders pre-coded androids which were displayed on two large screens (see Appendix 4) that battled against other participants pre-coded androids, for a top place in the competition. Another example was highlighted by the PHD student Mary, who was a participant in Microsoft's Imagine Cup, and described how daunting it was to present her software design to an audience of other participants, and judges -

- "The imagine cup was frightening before it, so it was kind of a presentation before it [and you had] to remember what you were supposed to be saying and not slip up for the presentation" – (Mary).

The coding competitions with were studied also highlighted Huizinga's (1949: 7-10) idea that play is "creative", and a "voluntary activity". In regards to the creative aspect, the PHD student Richard equated coding at the *ACM* competition to being similar to "Composing live". Also, the two third level lecturers, who are both involved with coding competitions spoke about the creative side of coding, as seen from quote above by Dr. Lennon. Dr. Pearce spoke about the process as,

> "coming up with a concept, an abstract idea, from whatever team is actually put out there via the *Games Fleadh*, the *Imagine Cup*, or *Dare to be Digital*, or one of the other events, that whole creative process of, here's an idea, now what are we going to do with it".

The *voluntary* aspect of play in relation to the competitions is on the one hand evident insofar as students are not required to enter the competition in order to complete their studies, yet on the other hand there are incentives offered in a number of different ways, depending on the competition. Both third level lecturers said they encourage students to enter the competitions to build up their portfolios in order to have something to show potential employers when they graduate. They also advise students that in producing something for a competition it helps in their final year projects. This was confirmed when I spoke team A, and team B where both said they were encouraged to enter the competition because it us useful for this reason. It was also found that additional incentives are sometimes offered, for example, one student recounted how his lecturer persuaded him to enter a competition.

"He emailed the top two people in the exams and said we have been chosen to do the *ACM*, this was when I was in second year, and so what we got in the second semester was an exemption from the labs, and during the lab times we were to go off and practice for these competitions" (Richard PHD Student).

Competitive coding competitions can also be seen to represent Sutton-Smith's (1997:215) theory of play and games, in that in engaging in this form of play participants are potentially learning skills *progress*, *fate, power, identity, Imaginary, Self, and Frivolity*.

The study revealed that for the people involved with running the competitions and for the participants, coding competitions are used as an educational tool. When the third level lecturers in this study were asked why coding competitions are ran alongside the curriculum, they both believed that the use of competitions was a good way of learning as it keeps the subject interesting. Dr. Pearce pointed out that "even without any competition there is competition from the point of view of if I do a good job I'll get a good mark". Dr. Lennon said that the competitions "are a natural fit because you are very quickly with software, able to mock something up and tear it back down again, so it allows you in the framework of a competition, or even over a weekend or a few weeks to make something". Additionally, the students interviewed saw the competitions as a good way of learning, with Mary seeing them as way of gauging how her skills are developing, or as she put it as a way to "test yourself and see what you can do and what you can't do". For Robert the competitions are an extra learning resource outside of his college modules. "I was interested in being better, I felt like the course was too slow, that was one my big complaints and I didn't have enough things to do, and so I saw my seniors were entering

these competitions, so I thought, ok this is cool, so I will do this". These finding highlight Huizinga's theory that through the action of play a person has the opportunity to learn skills which relate to the world around them. However there is also an aspect of the instrumentalization of play in that its' form is being changed, and rather than escaping the real world structure, the form has incorporated the structure, in order to derive a specific set of skills. This is also mirrored in the next paragraph.

Other motives for participating in coding competitions revealed a strong social aspect to the events, which all of the participants in this study described it as an important feature of the events. For Dr. Lennon, coding competitions are an opportunity for students to represent their schools, and colleges at events that bring many people together who share similar interests. Additionally to he believes that "competing against their peers [is] great, from a student's self confidence point of view [...] they get really positive feedback on the day, you will have students being really nervous coming to the event". This was confirmed in interviews, firstly with Eamon, a first year undergraduate student in computer science who had attended his first coding event recently. When asked why he was entering the competition he said it was a chance to get to know some of his fellow students, but he described feeling anxious before the event, and said "it's intimidating to go into a situation where other people are coding". Secondly when Eric (PHD Student), was asked what benefit he got from entering the competitions, he said they "expose you to something you haven't been exposed to, it shows you how good some people are and talking to them can be quite stimulating". Dr. Pearce described the social aspect of coding competitions, as the second most important reason why participants ought to enter them, next to "developing technical skills". He outlined the social benefits as "developing their communication skills, [plus] their

presentation skills" and he saw the social aspect as a representation of the way coding in industry has changed over the years.

> "this is not a sector for one person on their own anymore, this is a sector for bringing collaborative events together and I suppose that what the events are about, all of them, it's about bringing people together, with diverse skills to work on some kind of problem, and hopefully come up with some engaging solutions be it games or be it something else" – (Dr. Pearce).

This can be linked to McLuhan's theory that games are "social reactions to the main drive or action of any culture" (McLuhan 1964:235). Therefore, on the one hand, coding competitions are social events which involve teams of people working together to solve problems and create solutions, in a competitive environment. Yet, on the other hand they are a social extension of the digital culture we live in, which sees people working together on collaborative projects within and beyond the tech industry, while competing for business in local and global markets. What is interesting about McLuhan's (1964) theory, in relation to coding competitions, is that these coding games seem to have become entwined with the cultural action they represent.

As aforementioned, the competitions are primarily seen by educators and participants as an opportunity to improve their skills. Secondly they have an important social element to build self confidence and learn communication skills. Thirdly, the study found that because of this intertwining of coding competitions with the digital culture, these events are a functional junction for technology and software companies to scout for talent to work in the industry

of digital culture. During the participant observation at the Games Fleadh it wasn't difficult

to know who was sponsoring the event. The educators and students who were volunteering

to help run the event were wearing Tee shirts with the Microsoft logo on one sleeve and EA

games on the other. Additionally, talks were given by a Microsoft evangelist who promoted

a new educational tool that would help teach children the basics of how to create a game

through coding, and Bryan Neider from EA games gave advice on how to become successful

in the gaming industry. When asked about the involvement of companies like Microsoft in

competitive coding events, Dr. Pearce said it is important element, because they are the

ones handing out the technology and asking people at the events what they can do with it.

Dr. Lennon said what the companies want from these competitions is talent.

> "Talent, they are looking for talent and how do you find talent? Talent is problem
>
> solving, talent is innovative, talent is stress, how do you handle all of that? You
>
> compete, and if you can compete it means you've mastered a lot of fundamentals" –
>
> (Dr. Lennon).

Robert, one of the PHD students interviewed confirmed this by describing how he was

scouted by Google at a competition. On the one hand this can be linked to Adorno &

Horkeimer's (1993) culture industry theory that seen companies scouting for the best talent

in society to use their abilities to produce new commodities. However on the other hand,

when Robert was asked about what he intended to do with his skills in the future, he

highlighted aspect of Gramsci's (1992) theory of *hegemony* and organic intellectuals. He

said, "Im looking to start up my own company, and get rich, hopefully powerful and to the

extent that I can lobby the Government in some kind of way, to do whatever my heart

desires at that given time".

In relation to education and whether coding should be brought into primary and secondary schools, there was a conflict of thought between Dr. Pearce, Dr, Lennon and Tarah, who is involved with the CodoDojo foundation. Dr. Pearce felt that computer coding should remain out of primary and secondary education which should instead focus on a topic based method of teaching, for example maths and English, rather than a skill based method. Dr. Lennon felt computer coding should be taught in primary and secondary education, because he saw the CoderDojo model as more of a "juvenile training thing" where parents leave their kids for a while. Therefore, he saw the benefits teaching kids the skills of coding in a more structured way. While Tarah saw CoderDojo as fulfilling this role already pointing out that "by 2017 1.4 million jobs that are going to be un-vacated in coding and programming, so there is a massive skills gap there, and that's it is something for your society to move forward into. Whether Tarah's prediction is relevant to the Irish context is questionable by linking Holborow (2012) argument.

In relation to gender, the study found links to Wajcman (2008) who highlighted that the continued socialisation of women is preventing them from gaining access to the study of computer science. This was highlighted by the difficulty of finding the one female participant, Mary, for the study. When asked about her experience as a woman in area science and technology she said that as she excels in the field, she thinks her male colleagues and peers equate her success to only being related equality standards, rather than the skills and abilities she possesses. She gave her experience as a participant in Microsoft's Imagine Cup as an example, "they made a point in telling us that it was 20 percent female, the fact that they made the point in telling us really angered me because I was like it shouldn't make a difference". Mary went on to point out that it was thanks to

women like Ada Lovelace and Grace Hopper that computer science has advanced as much as it has, and interestingly in the interview with one of the experts, on the history of computer programming, Charles Babbage was only acknowledged.

4. <u>Conclusion</u>

This study of how competitive coding competitions instrumentalize play, revealed an imbedded connection between the use of play at these events and the digital culture of contemporary society. On the one hand play is being instrumentalized to teach people how to perfect their skill, through competition; while on the other hand, the industry surrounding the competitions use them opportunities for recruitment the new skilled labour force. Additionally, through these competitions, participants also learn social skills and when combined with the technical skills represent the drive behind the digital culture. This can be also seen as an opportunity for individuals to gain a hegemonic position within the society they wish to live in.

Future research could apply Actor Network Theory to more clearly understand the relations between the education system and the digital culture. For example by looking across who sponsors these events and what specific coding language is being used, a clearer perspective of power relations would be possible. This research did collate information in relation to these features; however it was beyond the scope of this study to apply this method of research.

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Appendix 1:

Participant:

Socioeconomic & General Intro,

1. Age
2. Sex
3. Nationality
4. Occupation
5. Family Status
6. Socioeconomic status
7. How do you spend your free time?
8. What forms of games and play did you like as a child?
9. Are you a competitive person?
10. What computer technology do you own? (Hardware/Software)
11. Have you internet access at home?

Coding

12. What do you like about coding?
13. How did you discover coding?
14. Are any of your friends and family interested in coding?
15. What do you hope to do with your skills in the future?
16. When did you start attending coding events?
17. Why?
18. Do you practice in your spare time?
19. How much practice do you put in?
20. Do you use code in your spare time?
21. If there was no event would you still be interested in coding?
22. Have you any preferred coding language?
23. Do you have any preferred brand of computer technology?
24. What are your thoughts on the role of computer technology/coding in the future?

Competition

25. Tell me how the day of the competition goes.
26. Why are you entering the competition? (Prize, skill, CV, Culture capital)
27. Do you enjoy being in the competition?
28. What do you enjoy about it?
29. In your opinion does being in the competition feel like play? (work?)

30. How do you feel before a competition?

31. How do you feel during the competition?

32. How do you feel after (win/loose) the competition?

33. What benefit do you see from entering the competition?

34. DO you put these events on your CV?

35. Does it help you in College/Job/other spheres of your life?

36. Does it matter who is sponsoring the competition?

37. Is there anything else I need to know?

Organizer:

Socioeconomic & General Intro,

1. Age
2. Sex
3. Occupation
4. Family Status
5. Socioeconomic statusHow do you spend your free time?
6. What forms of playing did you like as a child?
7. What computer technology do you own?
8. What type of computer technology do you use at work?
9. What do you like about coding?
10. How did you discover coding?
11. Do you code in your spare time?
12. Do you practice coding in your spare time?
13. When did you start attending coding events?
14. Why did you start attending coding events?
15. Have you any preferred coding language?
16. Do you have any preferred brand of computer technology?

Coding Competitions

17. Why do feel it is important for people to participate in the competition? (Prize, skill, CV, Cultural capital)
18. Do you enjoy helping organise/ run the competitions?
19. What do you enjoy about it?
20. Why coding is taught using competitions alongside education? (encouragement of students to participate in coding competitions)
21. Does organising/ volunteering for the event feel like work or play?
22. Do you put these events on your CV?

23. Does it help you in your work/college?

24. *What do you think participants enjoy about entering the competition?

25. What benefit for you do you feel you get from organising the competition?

26. Why do you think it is important to hold competitions? (ultimate Benefit)

27. Why do you think businesses such as Windows (Imagine cup) get involved with these competitions?

28. Does it matter who is sponsoring the competition?

29. What are your thoughts on the role of computer technology/coding in the future?

30. Is there anything else I need to know?

*if not participating themselves

Appendix 2

Consent Form – interviews

18/12/14

Thank you for agreeing to take part in my research project on programming competitions.

I am conducting this research as part of my coursework for a third year Sociology course on 'Fieldwork' at the National University of Ireland Maynooth.

This interview may take up to one hour and with your permission we would like to tape record the conversation. A copy of the interview tape will be made available to you afterwards if you wish to hear it.

There are no risks involved in this research and the interview does not constitute any type of counseling or treatment.

The benefit to you is that you will have access to the research when it is finished and you may use it to understand how your experience compares with others or to the wider sociology literature.

All of the interview information will be kept confidential. We will store the recording of our conversation safely. Your identity will be kept confidential and we will use a pseudonym to

identify your interview data. Neither your name or private information will not appear in the final research project.

Your participation is voluntary. You are free to refuse to take part, and you may refuse to answer any questions or may stop at any time. You may also withdraw at any time up until the work is completed.

If you have any questions about the research, you may contact me at MARK.MCMANUS.2011@nuim.ie or my research supervisor Aphra Kerr, at aphra.kerr@nuim.ie *and* (+353) 1 708 6140

"I have read the description above and consent to participate."

Signed_____

Date _____

Appendix 3:

Participant: Richard

1. Age -22

2. Sex- Male

3. Nationality – Irish

4. Occupation - PHD student

5. Family Status – Single, 1 sister younger

6. Socioeconomic status- Both parents divorced. Both new partners, mother works, currently, father unemployed.

7. How do you spend your free time? – TV shows, game of thrones, house of cards, or talking to people online, or coding, currently working on a game amongst other things, going to parties and drinking. Work and robotics

8. What forms of games and play did you like as a child? – Never liked playing with other kids like games like soccer and that. I liked playing my *Gameboy*, I played it religiously when I was kid my mother attributed it to the reason I learned to read was my *Gameboy*, playing *Pokémon*, I like video games as well, strategy games, Age of empires, command and conquer really enjoyed those games, I really enjoyed history, the history that it thought me, strategy competitive games, mostly single player, never with other people.

9. How long have you been around computers? – Probably since I was 10 but I never really looked into the internals of the computer until came to college, I was never interested in programming before that.

10. Are you a competitive person? - I think I am. I think one of the reasons I did well in degree is because I saw someone else who was good as well, and he drove me to be better at what I did in college. Now he won, he came first and I came second over-all, but I wouldn't done as well if it hadn't been for him I think the competitions really drove it. So yes I think.

11. What computer technology do you own? (Hardware/Software) – Smartphone, tablet, laptop and desktop, smart watch,

12. Any preferred brands of technology? – Not particularly, I prefer using *Linux*, over *Windows*; I have an *Iphone* before this. I don't really have any religious preferences when it comes to technology brand.

13. Have you internet access at home? – yes

14. What do you like about coding? – I like solving the problems that sometimes the solution is not always obvious, and sitting down and thinking about it for a while, it's really fascinating when I'm making dinner after I'm working on a problem and the answer will just come to me. My brain is still thinking about it, still churning to me, not consciously, and the answer will come to me and ill wack it out. It's really cool to see some of these things you have on paper being realified on an electronic computer. I think its kinds cool, there's a certain thrill to it.

15. How did you discover coding? – When I came to college, oh that's not true actually my uncle tried to teach me some coding, he works in *Google*, it didn't really work out

so well, when he tried to teach me, I thought it was very difficult, and then I came to college and I loved it there, I was way more focused about it, I think I hadn't completed my leaving cert when he tried to teach me, my mind was other things, but it convinced me to put it down on my CAO anyway, instead of being a maths teacher, which was probably a better decision now that I think about it.

16. Are any of your friends and family interested in coding? – Yes my uncle, and my auntie and her husband, are also in IT, and my auntie's husband has at least said he did some coding at some point, I don't think my aunty has, she hasn't said so anyway.

17. What do you hope to do with your skills in the future? – I'm looking to start up my own company, and get rich, hopefully powerful and to the extent that I can lobby the government in some kind of way, to do whatever my heart desires at that given time, If I have enough money to be able to do such activities, because I find that very interesting. I don't think I'm cut out for politics now, the best thing I can do is provide the best foundation for my kids, make sure they are looked after, and I think one of the ways to do that is to get lots of money through a company, now that may be a bit of simplistic approach but I do have an idea and I'm looking into starting something up, just time constraints right now.

18. When did you start attending coding events? – When I was in my second year of my degree, so it would have been just 19 at the time.

19. Why? – I was interested in being better, I felt like the course was too slow, that was one my big complaints and I didn't have enough things to do, and so I saw also my seniors were entering these competitions, so I thought, ok this is cool, so i will do this. I got slaughtered, I didn't answer any questions and I went home in a couple of hours, because I fell asleep, it was one of these, the first competitions I ever entered was

24hour competitions, so you would start at 1 in the morning and go until the next day, not in the afternoon, the questions were drip fed over time, one question came out and it turned out to be very difficult and destroyed our confidence for a time.

20. Do you practice in your spare time? – yes I do, this weekend actually, my friend of mine who is doing her internship, she is in the 3rd year of degree, we have to practice this weekend, for a competition that's coming up, so we are going to go over a few things. That's specifically for the competitions it's not even as I said spare time stuff, it's specifically for the competition.

21. Where is that competitions? –Cork, it's called the ACM competition, March 29th.

22. How much practice do you put in? Well it's very hard to keep track of it because we would be practicing throughout the year, but not explicitly, we would be looking at other questions and saying oh I say this solution it's really cool, that's sort of practice but not in an explicit sense. There was one year we had really explicit practice, so the first time I did a competition I got destroyed and then I did really well in the exams, and [name], he emailed the top two people in the exams and said we have been chosen to do the ACM, this was when I was in second year, and so what we got in the second semester was an exemption from the labs, and during the lab times we were to go off and practice we were to go off and practice for these competitions, so that was two hours a week at least, every week from the start of the semester until the competitions started, so probably 2 months explicit practice, but there would have been times when we would have done general practice as well.

23. Do you use code in your spare time?

24. If there was no event would you still be interested in coding? – Yah, but the competition coding is way different than what I do, see these would be what I see as

two very distinct coding things, where I'm writing my game, I'm taking my time, I'm writing some nice clean code that's maintainable, so I look ba... but with coding competitions it's kind of get it out as quick as possible before the guy beside you does and that's it. It's really way dirtier than the other relaxed coding I do, well not relaxed.

25. Have you any preferred coding language? – depends on the situation again, when I'm writing my game its C++, when I'm writing in a coding competition I'm writing in python, r the reason being is that you write maybe one line in Python that would take maybe 10 line in C++, so it's much more compact, and enables you to get at the problem very quickly. This is what you want. Its more is the algorithm correct rather than the language.

26. Do you have any preferred brand of computer technology? – No.

27. What are your thoughts on the role of computer technology/coding in the future? – I haven't really thought about it that much, [name] has spoke to me a bit about it, he's been pushing the government in whatever way he can, he's not exactly a lobbyist either, probably loosely describes as an advisor on occasion, one problem with coding is its not taught at school level, not by the state anyway. There is these things called CoderDojo and they teach kids, they are going to be an enormous problem those guys when they are my age or 4 years younger and they come into the degree and the department is trying to teach 2 people and that is people like me who did no coding up until college, and people who have done it since they were 10, and the gaps between those two are enormous, so something is going to be have to done about that and I think at that point the colleges will have to start to talking to the government about doing it in schools, the UK has a push. I don't think it's going to be

the new literacy, because some people can't, because I would do a lot of demonstrating called tutorials but students are given a lab and I'm there to help/ instruct them and I find that some people are incapable of purely doing anything,

28. Why do you think that is? I have no idea, but computer science is commonly referred to as the camel with two humps, that is people who do exceptionally bad, and then a portion who do exceptionally well.

29. So you don't think that everybody can code? – I dint think it's true at all, people who go to *CoderDojo* are people who are interested, so it's like your sampling the wrong people. It's like maths, some people will excel and others won't.

30. Tell me how the day of the competition goes – That depends on the competition so ill take about the one that's coming up now that's the *ACM*- I've done 2, you will travel down the day before with your mates and your team, you will basically be having the laugh with your tam and mates, there no big, cramming session on the train, it's very much relaxed, on the day then , we maybe talk to people from different colleges but that doesn't really happen because the crowd that is there are social introverts like myself, its relaxed, then we have a practice session to see if the system is running correctly, and see are people familiar with the code, what the input format is like and normally there is a score board but its irreverent in the practice rounds, then we have the break for a hour or so and then come back in for the competition which is normally four hours long, with the *ACM* you only have one computer which makes it more challenging, so if you have tree team members on one computer you have to be very careful about who gets to type when and where and what, there's no glory

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allowed, so you have to work well with your team mates, so we do that for four hours, we look at the leader board, and generally joke and laugh, we're a very loud team, or at least we had a very loud tea, we like to take the piss, and then the competition is closed, we go into a big room, they announce the winners, 1st, 2nd and 3rd, they congratulate the winners, they thank the sponsors, and then you go out for dinner normally and then you go home. That's day of the competition normally, it's a great tome and its lots of fun. Really lots of fun, I can't wait for it.

31. Why are you entering the competition? (Looking at the ACM- Its pretty all of the mentioned, (Prize skill CV), Less so CV now cause I'm stuck here for 4 years so I don't particularly care. There are prises, we won a prize first year, we came 3rd, and we won a goggle nexus 7, it's like worth 250 euro, we got 3 of them, gave it to my dad, so that was great, but we didn't win anything any year, its normally about being really loud and obnoxious, and because the 3 of us last year were so sky bunch and there are people there who can barely hold eye contact for more than 5 seconds and then were like screaming and shouting, it's just fun. That was really enjoyable, so the skills, I don't know if you learn that much on the competition, I learned a lot from the peers that I went with, they had specific ways of doing things that I hadn't seen before, so I did learn a bit from that, but normally its after the competition when you have to dissect the questions, you're like ok I now understand what that problem is and I will go learn t off or try to understand it, so it was CV, skills, sometimes the prizes, a lot of time it was like I want to crush the trinity teams, and the cork teams because there is a small rivalry there. All though it's not necessarily 2 sided, could be one sided. So why are you entering? – the social interaction, the chance to crush other teams in the most obnoxious manner possible while having the best time

32. Do you enjoy being in the competition? – yes, I very much enjoy them

33. What do you enjoy about it? – having g the *Craic* with team mates, trying to crush other team mates, also there are other team mates here in Maynooth who maybe think they are better than they are and its very very rewarding that when we're go to those competitions and they get 12 out of 50 and we get 30 out of 50, there's a secretly pat yourself on the back, because me and one other guy were close friends, we would always talk about things the way to hers do things and because they have a big ego, because I like to think I'm not arrogant but when I am it's kind of joking way and I fully admit I don't know certain things and I'm always learning but some people are not like that and crushing those people is very satisfying

34. In your opinion does being in the competition feel like play? - Yes, I would not play too many online multi player games against diff people, but I do think there can be similarities drawn between online play and what this is, if there was an online game instead of matches, then yah it's pretty much the same its about what you bring to the table (Me-as opposed to work is it play?)- I see it as play I don't see it as work at all this is weekend stuff this is evening stuff or sometimes day stuff I'm feeling a bit bold, i.e. not doing what I'm supposed to do for my mentor, id code, or work out a problem , a lot of these competition can be there phrased in stories, like one problem is imagine you have a bunch of blocks in a city and you want to know how many police drones you place on these blocks and every drone is say.. – Graph colouring problem where you take, (draws on page),...what was the question again? Oh yah play, right yes I think that is the case its purely bragging, showing off, fun, glory that's it it's not work

35. How do you feel before a competition? – Nervous, generally on edge, there has been times where I took the obnoxious thing and I turned it to 11, and that can make me more nervous., but normally nervous, excited and ready to go, normally your hyped up on caffeine, depending go the competition, if the *ACM* then yes if it's the *IEEE* 24 hours normally your just after waking up before a nap, and your trying to relax because the information is drip fed to you rather than the *ACM* which is one big rush, so it depends on the competition, *IEEE* is fun because tour coming into college at 1am with your mates.

36. How do you feel during the competition? Again it depends, *ACM* we were relaxed, and reading code, focused on trying to digest what's underneath it all, sometimes its frustration, one competition pretty recently, the *IEEE* thing, it was kind of crap, there was maths formula that you needed to do the question so in couldn't do it, weren't allowed *Google*, sometimes its frustration at the system but they are getting better. The *IEEE* are notorious for a question being broken, they are either logically wrong, or the input is being wrong but that's frustrating when one of our guys send two hours on a question but the inputs were wrong, and he was trying to change it then,.. The meta game is something I like to talk about the *metagame* is where you are competing in the competition and the questions but your competing against the design of the questions, his level of incompetence can sometimes know no bounds, *IEEE* ;at year, the 1st question was broken and it was written in barely English, this is an international competition, that's taken by 2000 people, (me, so what happens there), nothing happens, nobody is able to submit any code, we sit there and wait for the next question, but it wasn't revealed for 4 hours that it was broken and people were working on it for that 4 hours, it a mistake but a lot of it is pure incompetence,

there's another game here the *metagame*. Sometimes too you can see the inputs, in the code and you're not supposed to, so it's broken, and that's how you know, because you see the inputs your putting in the output, and your still not getting the right answer, …

37. How do you feel after (win/loose) the competition? – with the *ACM*, they freeze the score board for the last hour so you can't really tell and we were in 4th place at that time, so we were submitting code and it felt fantastic so after wards we were jumping around and joking and calling everyone else moron, we were having a really good time, we were really high, an when we came third we were ecstatic because of the whole scenario up until that, the *IEEE* is sort of a less intense feeling, its more so I want to go to bed after being up for 24 hours, normally in both cases you do feel exhausted, after it. This *ACM* coming up, I think I have the years under by belt, I really want to swing at these guys in really want to win, so if I don't I'll be pissed off.

38. What benefit do you see from entering the competition? – you get exposed to a lot more content in computer science than you would in the college, the college I would say is rather, lacking, is a bit of a joke sometimes, especially when it comes to the amount of people they pass and the absolute zero clue they have, constantly pissing all over my qualifications that I earned, I worked really hard for and I know what I'm doing, some people can take a really option in 4th year, get the same grade as me the amount of work and brain power they put in to do that specific task is so different is not even measurable, the diff between a good programmer and bad programmer is not the amount of time, it's not 1 hour Vs 4 its 1hour Vs never doing it in the first place, it's really immeasurable, not that I'm god gift to the earth either, I have my flaws and that's fine,

It does expose you to something you haven't been exposed to, it shows you how good, some people are and talking to them can be quite stimulating, am sometimes, but most times the people there aren't the most social bunch, the competition drives you to learn, there's a lot more content, exposure to problems which the university maybe doesn't have time to cover here,

39. DO you put these events on your CV? – Yes I do, I haven't updated it for a while but I would put them on it, they would be talking points if anything.

40. Does it help you in College/Job/other spheres of your life?- It can help in some college aspects were you see a fourth year project so that very helpful, in work, I guess college for me is work, in my placement with a company in 3rd year, they competitions weren't that helpful, the competitions code is messy not like work code, so I don't know if they competitions actually got me job or I can't remember is if I actually talked about them in a interview, I think it's because I don't put don't the places I came because they are not really worth talking about, sure your CV can get you into an interview but the interviewer can normally tell you after a minute whether or not you have a clue what you are talking about. The competitions can probably prepare you for the interview.

41. Does it matter who is sponsoring the competition? – not particularly no, I think most companies do it because they get to poach in some way young intelligent programmers, with no commitments in life, who may be smart enough, it's like a pre interview almost, *Google* sponsor a lot of them because they like to grab these young programmers, put them to work on devastating projects and burn them out as quick as possible, cause of the naivety involved with them I guess, and myself at some point, less so now, I understand that companies will target some young programmers

like myself with no wife no kids because I can spend hours at work, with nothing at home, what am I going to so watch TV? These people are prime targets, people who love the thrill of solving problems where the guy has to go home at five, to spend time with his daughter, it's much more different, all you have to do is offer his pizza and he stays, I don't have to cook now.

42. Why do you think companies are sponsoring the competitions? – pretty much that, am sometimes they give, like Google give a talk at the *ACM*, everyone who came third onward in the *ACM* they were approached by Jennifer Pentof, or whatever her name is, she is a hiring manager in Google, she gave us her card, everyone who came third, we were invited to some event afterwards, which was nice, but you know it's, Google doesn't make money by just having events like that, they make money by hiring programmers who are very good, I want one of them, I don't think I did too well in their interview, but there's definitely a motive to it, some people who sponsor competitions and don't do anything about it they don't make any sense to me like *Deloite*, also sponsored the ACM, they didn't have a presence there, at all, that to me is pissing money away, they get there name out there which is ok, but the way Google handled it was significantly better, Microsoft sponsored the prizes as did *Google*, *Deloite* didn't, now maybe they don't make nice consumer products, but still. It seemed a waste, anyway,. Yah , I'm pretty sure the top teams are contacted, by sponsors saying hey come for a interview, please, because some of these guys who come first in the *IEEE* they're like, amazing, they have been working on it for,, it's not even a matter of time it's a matter of significant intelligence, it's not just time,

43. Is there anything else I need to know? No.

Appendix 4