

Leeds Beckett University
Faculty of Arts, Environment & Technology

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Joanne Kennedy C3369865
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Article I. The Knowledge Gap

Is there a knowledge gap between those who work in IT and those who don't? Society is now becoming increasingly accepting towards technology, children are now growing up with things like social media, people are using online services to shop and pay for bills and some people are even using the services to make a living from home. However with the expansion of technological advances comes the need for technological knowledge, which raises a number of questions, for example are we dependent on technology? Will tasks that were once somewhat simple, become impossible to achieve offline? And will the older generation get left behind? (Mortimer Spinks and Computer Weekly, 2015)

A recent survey shows that 52% of technology professionals believe they fully grasp the privacy and ownership policies they agree to on social media networks, and 73% believe they understand the risks behind posting content online, however the IT professionals believe only 10% of non IT professionals would understand the policies they are agreeing to and only 11% would understand the risks of sharing information online. Are these figures a solid representation of the knowledge gap or has the IT knowledge gone to the IT professionals head, making them believe they are much more aware than the non-IT professionals? (Mortimer Spinks and Computer Weekly, 2015)

Is the knowledge gap created by people's unwillingness to learn, accept and use available systems? People tend to only consider switching to a technological solution if they believe it will help them to perform their tasks better which is often known as perceived usefulness, and if it will help them to perform their tasks quicker and easier which is known as the perceived ease of use. If the benefits of using a technological solution are outweighed by the effort required to use it, it's likely that people will stick to traditional methods. (Davis, 1989)

Due to non IT companies now deciding to adopt digital technology and allowing non technical users to aid in the selection of the systems, it is important for people to become more tech-savvy, but also for tech-savvy people to become more business-savvy. (Banda, 2016) The 2010 recession caused a major shift in IT roles and

responsibilities and IT professionals are now being urged to acquire both technical and non-technical skills with the recent rise in the demand for IT professionals in permanent positions. This figure rose by almost 12.4% in July 2010. (Bateman, 2010)

Just under a quarter of people working in technology said the 2014 scandal which involved celebrities personal pictures, which were stored on their devices, being posted online against their will, stated that it had altered their perception of privacy online. Although this shocked many people it seemed that people who worked in technology were not that surprised, so maybe it is safe to say that the knowledge gap between those who work in IT and those who don't could have a big impact on society today. (Mortimer Spinks and Computer Weekly, 2015)

In 2014 computing became a part of the core curriculum in schools due to the majority of jobs in the future being likely to require digital skills, whether the role is a technical or non-technical role. (McDonald, 2016) Hopefully that means that in the future the knowledge gap won't exist, it will be a thing of the past, but what if the reason people aren't adopting technology in their lives is because they simply cannot afford it?

In 2013 a survey found that 19% of people who were non-internet users stated that the cost of PC's and Internet services was the barrier. One third of adults that do not hold a high school diploma are permanently offline and households earning less than £20,000 per year are eight times more likely to be permanently offline. There will always be people that drop out of high school and with future jobs requiring technical skills; it will prove difficult for non-technical users to get a job meaning they won't be able to afford to keep up with technological trends. (Anderson and Perrin, 2015)

There will more than likely always be a divide between the rich and the poor and as one can expect, it is the rich that are educated to a high standard and have access to digital materials and resources at home and in school, however children that are schooled in poor areas do not get the privilege of access to these digital resources which leaves them without the technology skills they need for their future. (Soltan, 2016)

It is thought that most young adults, minority groups, those with little or no education and those in the low-income bracket, mainly access the Internet through their smartphones and although smartphones have aided in bridging the gap by providing internet access to people that may not be able to afford computers and laptops, the divide is still very much apparent with 54% of teachers stating that only 18% of students had good internet access at home. If technology is integrated with most teaching and learning, how are the less privileged students meant to keep up with the work? (Soltan, 2016)

People say that technology will take over, but it is also important to remember the predictions that have been made in the past about technology and how these predictions didn't become reality, for example Thomas Edison predicted in 1922 that televisions would replace school textbooks, Benjamin Darrow predicted in 1932 that radios would replace teachers and textbooks in schools, and Seymour Papert predicted in 1984 that computers would replace teachers as the key instructional tool. (Lim et al, 2013)

After Ed Snowden released government intelligence 25% of IT professionals stated this concerned them, however only 10% of them changed their online behaviour. After the government leaks came to light, it is safe to say that the people who have IT knowledge have the ability to not only build, but also destroy the world in which we live. (Mortimer Spinks and Computer Weekly, 2015)

Getting the older generation into IT may pose as a challenge, which is not helping to bridge the knowledge gap, 32% of non-internet users stated that the reason being was that it was too difficult to use, and 8% actually said it was because they were too old. There are only 3% of adults between the ages of 18-29 that are permanently offline however there are 39% of adults aged 65+ that are offline. It is important to remember that back in 2000 86% of adult's aged 65+ was permanently offline, which shows that the number is gradually decreasing. (Anderson and Perrin, 2015)

In terms of why the older generation should go online there are a number of reasons, for example to stay connected with old friends and family, as well as make new

friends, to stay up-to-date on current news and affairs, to enhance hobbies and interests, to gain confidence, to research the past and present, to become socially active and help put an end to loneliness, and to enjoy learning and ensure older parents always have a voice. (When They Get Older, 2016)

We know that children are being trained in IT through school but what about the people already in employment? The lack of IT skills mainly comes from people who work for smaller firms or who are self-employed, although the government and industry bodies are working to improve this problem, it is up to businesses to get involved and help to bridge the gap as most professionals would agree that continued training does help towards generating success. (Hollingsworth, 2015)

As we have established, a large proportion of non-technical individuals are being left behind, however are tech professionals that lack current skills also being forgotten about? Web technology is now moving so fast; even those that used to be in the know are now falling behind and into the knowledge gap. It is said that developers and programmers now hold the key for the future and are crucial for a new era of work, they are the individuals who know how things are built, how they are enhanced and the potential for what they can do. (Beecroft, 2016)

Might this be the reason IT professionals are not working towards bridging the gap? Do they want the power? Although there are lots of online tasks that any user with bare to minimal tech skills can complete, the way the systems are built make them impossible for novice users to interpret, recreate and add to, but is this the idea, do IT professionals want to share their knowledge with the rest of the world? (Garrity, 2003)

Is the knowledge gap between technical and non-technical individuals due to mistrust? A lot of non-technical individuals have stated that they often cannot work with or rarely get the chance to work with technical people due to technical people not hiring them. It is important to remember that individuals with different backgrounds can bring a new set of skills to an organisation and it may be that technical folk do not realise the potential and value that they may bring, but this may

also be down to technical people not being aware of what to look out for when recruiting non-technical employees. (Meher, 2015)

Backing up the above point Joanne (2016) explained that when she was working for an IT company as a middleman between sales and development, communication between each department was lost and skills were misjudged. The majority of the time problems would be referred to the sales team to be dealt with due to them being the ones bringing in the money, however it was the development team that needed to be consulted. Is the solution to teach technical teams marketing knowledge, and teach marketing teams technical knowledge?

Tash (2006) states that a cheap and risk-free way to bridge the gap is to follow three simple steps, firstly consolidation to eliminate any redundancies and improve overall effectiveness, secondly standardisation to define business profiles for processes and services with reusability being the key, and lastly but probably most importantly, communication to ensure technical and non-technical teams share knowledge with each other, whether this be with a common reference model or through the defining of a common vocabulary.

Article II. The Gender Imbalance

It is no secret for anyone working in the IT industry that there is a gender imbalance; men have been dominating this sector for years, whilst women struggle to get in, and once in, struggle to stay. In 2010 a survey was completed by graduates and although more women than men graduate, it was men that made up 65% of STEM degrees. Are women being pushed out of this industry or are they just set in their ways and playing into stereotypes? (Manpower Group, 2015)

There are a number of programs that support and encourage women in science, technology, engineering and mathematics (STEM); however the average number of women working within technology is falling year upon year. In 2012 15.7% of women worked in the IT sector, in 2014 this percentage had fallen to 14.6% and last year this percentage fell again to a measly 12%, this outlines the fact that not enough is

being done to rectify the gender diversity issues that are so apparent. (Mortimer Spinks and Computer Weekly, 2015)

Should gender imbalance be an issue for men and women? A recent study by Mortimer Spinks and Computer Weekly (2015) points out that 33% of women had spoken about the gender imbalance issues within the past week, whereas only 16% of men had. This suggests that men don't see the gender imbalance issue as a concern for themselves – this in one way might be true, however it is important for men to understand that their customer base is largely formulated by women and failing to care and provide for them in the workplace could result in a vital and rather expensive error. (Barker, 2016)

Many IT bosses state that they would be willing to hire more women but they don't receive many applications, shouldn't they be asking themselves why? And what they can do to change this? As a pose to just brushing the issue aside. If women are provided support and mentored in an environment that allows them to thrive, this issue could be resolved, but when IT company owners see IT as part of a male culture and don't want to hire women to 'do a man's job', it's highly likely the company employees will also carry this negative attitude towards women in IT, which leaves the women that do make it into the industry feel intimidated in their working environment. (Pesce, 2014) Many women who follow a career in IT often change careers later down the line due to very few women being given the opportunity to progress onto senior management positions. (Kelly, 2007)

It is a common belief that gender diversity issues within the IT sector begin in schools; specifically, secondary schools when teenagers discover their sexuality and have a greater understanding of gender roles and sex-role stereotypes. (Pesce, 2014) with computing now part of the core curriculum in schools this will hopefully help to close the gender gap, however if companies are looking for computing A-Levels or graduates in this discipline, it becomes the school's job to teach the subject in a way that promotes gender equality and encourages young women to further themselves in this field.

In 2012 a survey revealed 17% of girls had learnt how to code in schools whereas 33% of boys had, which is almost double. Although the number of IT jobs is forever increasing – there is currently around 1.2 million IT jobs waiting to be filled across the UK, the number of women in IT jobs has only increased by 1% in the last 5 years. (Barker, 2016)

It is important for teachers to ensure that they are teaching materials that do not come across as gender bias. Most people who work in tech or have a particular interest in the subject will know that the career prospects are endless and IT can suit all interests, however young students will not know this due to the perceived preconceptions that computing is for the male gamers of the world, and this is probably why the number of ICT graduates in the EU that are women, are falling in comparison to other regions of the world. (Kelly, 2007)

Cisco is a multinational technology company that understands the gender gap in IT and plays a vital role in trying to improve it, for example on International Women's Day in 2007 Cisco launched a project purely for women to improve their technical skills, however they want to focus on women in the Middle East, Africa, Eastern Europe and Latin America, so this does not help the problem in the UK, (Kelly, 2007) even though by 2017 it is expected that less than 25% of women in developed countries will be in IT jobs. (Barker, 2016)

Cisco along with other major companies such as BT, Motorola and Nokia are also taking part in an EU program which gives young women the opportunity to shadow a female role model for the day, this programme will hopefully play a part in bridging the gap of women in IT, because at the moment “two thirds of telecommunication companies have no women on their board of directors, and in 14 major companies, less than 10 per cent of board members are women.” (Kelly, 2007)

Although there are a number of organisations that work to highlight and promote opportunities for women in IT by raising awareness to show people there is another gender, “systemic problems require systemic solutions” (Pesce, 2014) and the industry needs to work together in order to diminish these issues completely.

However a number of organisations do not share these values, for example last week Microsoft the well-known multinational company hosted a party at the Games Developers Conference in San Francisco and decided to hire provocative dancers in barely-there school girl outfits which sparked outrage with female developers which lead to many of them walking out and some even made official complains.

(Thomson, 2016a)

Microsoft has a global vision, which focuses on empowering people, and organisations to further achieve themselves in education, business and society. (Microsoft, 2016) They also claim they want to bridge the gap in gender diversity within the gaming industry and 24 hours prior to the Games Developers Conference they even hosted a 'Women in Gaming' lunch to consider how to attract more women into the industry, unfortunately for Microsoft the answer was not seedy dancers.

Although Microsoft has apologised, the incident regrettably did not come as too much of a surprise for many, due to Microsoft's CEO stating last year at a 'Women in Computing' event that "women in the industry should trust karma when it came to getting pay equality rather than demanding fair pay." So Microsoft are happy to portray themselves as a company who cares but they do not expect women to be asking for a pay rise anytime soon. Have Microsoft not heard of the pink tax?

(Thomson, 2016a)

On the topic of pay, a recent survey showed that computer programmers have the highest gender pay gap, on average male programmers get paid 28.3% higher than females. (Kennedy, 2016) There are however some roles that pay women more than men for example event coordinators and logistic managers, so I guess an argument could be made there from men in these positions. (Pryor, 2016)

Dice (formerly known as the IT Job Board) is the latest company to be scrutinised over sexism allegations, with their advertising campaigns emerging all over social media by irritated women. Their campaigns feature both men and women posing in an unprofessional and provocative manor with a capitalised slogan which reads 'hot tech talent.' Although this may not bother everyone – men in particular, because of

the gender imbalance issues which we are clearly facing in the IT industry, women do not want to be presented and seen as an object in order to promote and sell a business. However the company have chosen to back their campaign as a pose to apologising for the offence it has clearly caused some people, which outlines the fact that they do not value women, nor their opinions. Will this ever end? (Martin, 2016)

The gender gap is an economic issue as well as a social one which costs the UK 4 billion annually (Barker, 2016) which is why David Willetts, minister of state for universities and science launched The Tech Partnership which aims to provide a 50/50 gender balance in IT by 2020. (Bateman, 2014) However it has already been one year since this statement yet there haven't yet been any dramatic changes thus far, let's see what the next four years bring.

Is cross-training the solution we have been waiting for? Although 66% of women in IT came straight from education, the remaining came from different business areas and backgrounds. (Mortimer Spinks and Computer Weekly, 2015) But what business areas and backgrounds? This is an area that should be researched, instead of just addressing and airing the issues that are already public knowledge. It is thought that companies who not only engage with women, but also integrate them into the workforce see high business growth and social cohesion, so it is surprising that many businesses don't try to help bridge the gap, if not for the economy then for their own personal gain. (World Economic Forum, 2015)

A company that was thought to be helping to close the gender gap in IT was UK energy company EDF who started a competition to inspire young women to think about a career in science and technology. Controversially, to everyone's surprise the winning entry was from a 13-year-old male. (Thomson, 2016b)

Obviously EDF wanted to ensure they remained equal and unbiased to both genders, hence why they opened the competition to males and females, however if they were trying to get young women interested in STEM subjects, picking a male for the winner was probably not the best way to go about it. A better solution would have been to run two separate competitions and have a winning female alongside a

winning male – similar to the head boy and head girl award in schools. (Thomson, 2016b)

Although problems still exist the gender gap in IT may finally be on a road to recovery however the next dilemma might be the human gap in IT as the World Economic Forum estimates that by 2020 five million jobs will be lost to robotics and artificial intelligence, I'm sure this will have the men talking. (Palmer, 2016)

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