

'Is Online Education the Disruptive Innovator Which is Required for Addressing the Digital Skills Gap'

An Assessment from a Leaner's Perspective to Understand the Viability of Online Education as a Method of Closing the Digital Skills Gap

# **Masters in Business Administration 2024**



Adam Rooney X22144099 Supervisor: Jennifer Evans Fitzsimons Submitted to the National College of Ireland on the 7<sup>th</sup> of August 2024

# Declaration

I hereby declare that this material which I now submit for assessment and grading on the programme of study leading to the award of Masters in Business Administration, of the National College of Ireland is entirely my own work and has not been taken from work of others, save for and to the extent that that such work has been cited and acknowledged with the text of my own work.

Signed: Adam Rooney

Date: 7<sup>th</sup> of August 2024

## **Abstract of Research Study**

As we are transitioning into a new era of digitisation society must ensure that it is done so without the widening of pre-existing social-economic divides. Therefore, ensuring equal access to reskilling and further education has never been so crucial. This study will explore, from a learner's perspective, the perceptions, challenges, and benefits of online learning, while gauging their understanding of the digital skills gap.

If online education is perceived to hold less, or no value, in comparison to traditional classroom-based learning it will not be adopted by learners and therefore hold no value in reskilling the labour forces as it attempts to meet shortage of digitally skills workers, this research will attempt to investigate this perception. The research will also have diversity and inclusion within the digital sector as one of it's key focus, exploring not just *how* to close the digital skills gap, but *who* will be involved in closing it.

The main outcome of this research will be to determine if online education is in fact a disruptive innovator within the educational sector and if possesses the ability to meet the growing digital skills gap. The outcome of this research project led to a final discussion and recommendations for future research in this area of study.

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#### **Chapter One: Introduction**

## **1.1 Introduction**

This chapter outlines the background, context and the purpose of this study. It defines the term *"digital skills gap"* is and refers to both the challenges and opportunities facing the global economy as it transitions into a new era of digitalisation. This chapter also offers my personal rationale for undertaking this research study in this particular area, along with aims of the research study. This will then follow a brief outline of succussive chapters.

#### **1.2 Background and Context**

On a societal front, a paradigm shift is underway in how we work and communicate with one another. This paradigm shift means that in human history there has never been a greater time for promise or potential peril, how we interaction with new emerging technologies such as artificial intelligence (AI), robotics, nanotechnology, biotechnology, and quantum computing, to name a few, may have lasting implications that will be felt for generations to come. It is imperative that as we are witnessing profound shifts in technology that our governing bodies and institutions move in tandem to meet the demands of rapid change. Polices of adaption rather than resistance must be implemented by all to ensure that the pace of the ever-growing digital skill gaps is slowed down and ultimately met. The European Union (EU) which commissions The Digital Economy and Society Index (DESI) has cited significant challenges with digital proficiency across Europe. Its findings show that 4 out of 10 adults and every third person in the workforce lack basic digital skills ((DESI), 2022) without this issue being adequately addressed the block and its member states will fail to be competitive on a global stage, as a result of it's inability to attract foreign investment, the issue however is not refined to EU but rather a global issue which requires a global solution.

The full effects of the second industrial revolution are still yet to be felt on a global stage as 17% of the global population, which equates to approximately 1.3 billion people, still lack access to a consistent and reliable flow of electricity. While this is also true for the third industrial revolution with almost half of the world's population, approximately 2.6 billion, still lack access to reliable internet, most of whom come from the developing world. (Schwab, The

Fourth Industrial Revolution , 2017) There are many social economic factors that contribute to this lag, but if the digital economy is going to meet its full potential there must be representation on the global stage, this includes addressing the chronic shortage of women in the tech sector, which is something that will be addressed in this research. Although the opportunities which come with the advancement of technology may be both exceptional and frightening, the reskilling of the global workforce must be equitable and consistent so to not drive greater inequality between the developed and developing countries as well as amongst genders. It is likely that to meet the demand of re-skilling the workforce and closing the digital skill gap, that a holistic view of the current delivery method of the education system will need to be evaluated. Since the global pandemic there is has been a shift away from the traditional bricks and mortar delivery method of education towards a more flexible online learning method of education, this disruptive innovation may be the key to unlocking the reskilling of the workforce within the timeframe which is required so not to halt the rapid progress in the advancement of technology, whilst at the same time ensuring that the re-skilling can be both inclusive and diverse.

#### 1.3 Rationale for undertaking this research study

The rationale for undertaking this study is to further investigate the global digital skills gap and to evaluate the effects of both action and inaction in this area. I personally work in a relevant field to this study and my conclusion to date has been that the advancement of technology poses great risk to equality as more sectors transition to a higher skilled, lower volume workforce. To combat this, education within the tech sector must be made accessible to all, with a delivery method which is fit for purpose.

#### 1.4 Aims & Objectives

The first aim of this research study is to bring to light the extent of the digital skills gap and the risk posed to both governing bodies and institutions if this kill shortage is not met. It is the hope that more research will be conducted on this issue with a view to highlighting both the opportunities and risks posed. The second aim of this research is to better understand how disruptive innovation in the form of online and short form education can both accelerate the

timeframe in which the digital skill gap can be met as well as allowing for greater inclusion and diversity that currently exists within the tech sector.

The objectives of this research are to answer the following questions:

- 1. What is the perception of online learning and its effectiveness.
- 2. What are the perceived benefits and challenges with online learning
- 3. What is the importance of ensuring diversity and inclusion within the digital economy.

It is hoped that the research carried out within this study will provide greater insight into these questions and ultimately determine if online education the disruptive innovator which is required for addressing the digital skills gap. The research questions have been formulated so to give a boarder understanding within the scope of this research. As will be shown in this research the number of learners who have opted for online education has increase significantly over the past decade, this research will undertake a qualitative research approach to understand the 'Why' to this phenomenon.

#### **1.5 Outline of Successive Chapters**

This research study is divided into five subsequent chapters, each of which contributing to defining the process of the study. Chapter two will undertake the review of literature before moving onto the research methodology, which will then be followed by the analysis and discussion of data and recommendations for future studies, and finally the conclusion of the research.

Chapter Two - Review of Literature – presents current research of the topic as well as challenges which are cause by digital skills gap. The literature review will focus on the issue from both a European and international perspective. Chapter Three outlines the methodology approach employed by this study. It examines the methods which were used in order to obtain the data for this study, interaction with research samples, ethical considerations, and the limitations of the study. Chapter Four provides an overview the results gathered in the findings of the report and discusses the relevance of its finding through the lens of the literature review which was conducted in Chapter Two. Chapter Five concludes the study critically analysing the study whilst offering guidance and recommendations for further studies on this topic.

#### **Chapter Two: Review of Literature**

### **2.1 Introduction**

When ChatGPT first emerged 2022 the term AI became a lot more prevalent in personal and professional life, this was then quickly followed by fear and anxiety around the capability of this new tool and the effects it would have on the labour force. In real terms AI was already in existence in daily activities for quite some time, this includes chatbots on websites, image recognition on our phones, and recommendations engines as seen on platforms such as Netflix's. These technologies are considered to be Narrow AI, advancements within the field have now led us to General AI, which has caused governing bodies and institutions to start paying greater attention to the developments in this field. General AI possess cognitive functions similar to human beings and although it still remains largely theoretical it is the building blocks for Large Lanaguage Models (LLM) such as ChatGPT and completing platforms. Advancements in AI are pertinent within digital skills gap conversion as it will become, or could be argued, has already become, a key factor in employer hiring trends. If the pace of further education and upskilling does not match the development in technology, society is at risk of creating greater inequalities through a more exclusive labour market where the highest paying salaries are dispersed amongst a small few highly trained worker. This however does not need to be the case; humans are adaptable and can move in tandem with advancements within technology, this trait was showcased throughout the agricultural revolution when a predominantly manual labour-intensive sector was able to transition as technologies grew. Reference to the development within the field of AI will be cited within the literature review of this research as it covers the following sectors:

- 1. Defining the digital skills gap
- 2. Reskilling the workforce
- 3. Inclusion and diversity within the digital skills sector
- 4. Online Education as a disruptive innovator
- 5. Conclusion

## 2.2 Defining the Digital Skills Gap

The digital skills gap refers to the to the discrepancy between the digital skills required by the labour market and individuals available to fill those roles. In Europe, more than 90% of professional roles now require a basic level of digital competency, yet 42% of Europeans lack these skills. It is for this reason that the *Digital Education Action Plan (2021 – 2027)* was commissioned by the European Union with an aim of two key objectives, firstly; fostering the development of a high-performing digital education ecosystem, and secondly; enhancing digital skills and competencies for the digital transformation (Union, 2023) The action plan seeks to meet the targets which were set out in *Europe's Digital Decade: digital targets for 2030*, which is targeting 75% of EU companies to adapt to Cloud, AI, or Big Data and 100% of key public services to be automated and online by 2030. These targets will also have an impact on personal as well as professional life as it includes targets for greater connectivity through a commitment for gigabit data to be accessible for all member states (Commission, 2024)

At the heart of the digital skills gap conversation is Employment. As previously mentioned, labour market scepticism regarding the advancement of technology is nothing new, in 1931 one of the most prominent economist John Maynard Keynes famously warned that "due to our discovery of means of economising the use of labour outrunning the pace at which we can find new use for labour" (Wilson, 2020) Keynes prophesied disappearing jobs within the labour market as a result of the advancement of technology, this proved not to be the case, but could it be this time? There is no denying that over the past decade some labour-intensive occupations such as cashiers, bookkeeps and telephone operators have been replaced by advancement in technologies. This disruptive innovation may in fact be a substitution for capital labour which forces workers to become unemployed, but there is however a balancing act at play. The capitalisation effect of these advancements will lead to greater demand for new goods and services which will results in job creations. These transitions are gradual which are therefore are not as well publicised, they are also not as headline grabbing as some of the fear mongering which accompanies advancement in technology and the labour market. For example, at the start of the 19<sup>th</sup> century 90% of the labour force worked the land, today that number is as low as 2%. In contrasting effect, it took a little under a decade for the app economy which was only created in 2008 when Steve Jobs allowed outside developers to create application for the iPhone, to achieve \$100 billion plus in revenue, and in doing so surpassed the film industry which had

been in existence for over a century (Schwab, The Fourth Industrial Revolution, 2017) These signs are positive for the existence and validity of the labour market as we know it but it's imperative that governing officials and industry leaders identify that the skill gap is in existence and that it is clearly defined and targeted within the correct sectors.

## 2.3 Reskilling the Workforce

Closing the digital skills gap and meeting the demands of the labour force for skilled workers must be met with a multifaceted approach by educational providers. Historically, education has been a low productivity growth sector as teaching is labour intensive. Pre-covid it could be argued that education was one of the last institutions yet to be touched in a meaningful way by the advancement in technology as the most common method of teaching was within a brick-and-mortar classroom with an educator at the front. However, during the Covid-19 pandemic in order to continue operating all educational providers needed to take a more technical approach to ensure their survival. Post-pandemic we have yet to observe a return to the status quo with online studies becoming increasingly popular, particularly amongst part-time students. In 2020 in the wake of the pandemic, 74.5% of students in America enrolled in an online further education program. This dropped back to 54% in 2022 but still represents significant growth from 2012 when 75% of college students opted for in classroom learning, based on this demand the e-learning market is projected to grow by 20.5% from 2022 to 2030 (Hamilton, 2024)

Providing the necessary infrastructure through classroom and online learning as well as both part-time and full-time will improve both the speed and the quality of learners that will be available to meet the digital skill needs. There also a requirement for a strategic approach to what roles are most at risk and what skills need to be acquired to meet the jobs that will be most in demand. Studies of this nature have already been undertaken and must form part of any conversation into further strategic polices regarding the digital skills gap.

# Most Prone to Automation

Probability	Occupation
0.99	Telemarketers
0.99	Tax preparers
0.98	Insurance Appraisers, Auto Damage
0.98	Legal Secretaires
0.97	Real Estate Brokers
0.97	Hospitality workers
0.94	Couriers and Messengers

## Least Prone to Automation

0.0031 Mental Health and Substance Abuse Social Workers	
0.0042 Physicians and Surgeons	
0.0043 Psychologist	
0.0055 Human Resource Managers	
0.0077 Anthropologist and Archaeologist	
0.0130 Sales Managers	
0.0150 Chief Executives	

# (Osborne, 2013)

Strategically aligning the most in demand skills with occupations that have the highest risk of job lost through automation will ensure there is not a disproportionate skills gaps within certain sectors. Marrying up soft skills from occupations which are most prone to lost through automation with jobs which are now in demand may also increase the likelihood of a more seamless transition into the digital sector. For example, with the correct upskilling and further education Telemarketers, which have been shown to be one of the occupations most at risk, are strategically positioned to meet the demand within the digital marketing sector, a sector which is estimated for a 6% growth rate – higher than the average job growth rate by 2023 (Statistics, 2024) The sector is an example of how the advancements in AI are enhancing and complementing the digital sector which is estimated to be valued at \$1.5 trillion by 2030.

Greater access to educational platforms and infrastructure, married up with strategic placement of workers within sectors where the digital skills gap is most prevalent is important. This however can only be possible with the correct strategic political policies are in place, this is equivalent to the Irish government increasing education and training within the construction industry in response to the housing crisis, the same response must be adhered to within the digital sector. A report commissioned by Google, one of the largest contributors to the Irish exchequer in the way of corporation tax, concluded that a "meaningful" investment within the Irish digital sector could contribute to a further  $\notin 9.5$  billion to the Irish GDP by 2025, furthermore, the report observed that only 11% of Irish Small, Medium, Enterprises, feel their employees possess the necessary skills to meet the growing demands in technology (Google, 2022) Over to past two decades a fair observation would be to conclude that Ireland has had a robust strategic policy regarding attaching direct foreign investment into the country, this has come through tax incentives, namely low corporation, as well as a skilled workforce and a reliable education system to keep the conveyer belt of talent moving to meet the demand of the large multinationals such as Google. This however may be in peril unless strategic government polices are in place to ensure the Irish workforce remains competitive on the global stage as we move into an AI led future.

#### 2.4 Inclusion and diversity within the digital sector

The digital skills gap is a global issue which requires a global response, to meet the growing needs within the sector contributions from all demographics are required. A lack of inclusion within the digital sector will most certainly result in greater disparities amongst classes and exacerbate existing socio-economic inequalities. A term which was first introduced by the EU in 1999 to represent the need for inclusion within the digital sector is 'e-inclusion' this refers both inclusive Information Communication Technology (ICT) and the use of ICT to meet inclusion objectives. In other words, e-inclusion is a term which is used to demonstrate to what extent technology can help to equalise existing socio-economic inequalities, facilitate levelling up of economic opportunities and enhance better cultural aspect of society (Communication, 2007). However, e-inclusion comes with many barriers, as cited in the introduction to this research approximately 2.6 billion people globally still do not have consistent and dependable access to internet connection. However, significant progress has been made within this space with Sub-Saharan Arica observing a 115% increase in interest usage between 2016 and 2021 while over 160 million Africans have gained broadband access between 2019 and 2022, digital transformation will not only drive greater economic development but also ensure global einclusion (Bank, 2024) Without access to further education and the appropriate infrastructure required to deliver such education, e-inclusion can never be fully achieved.

Inclusion and diversity within the digital sector hold bondless opportunities for organisations, particularly those operating on a global scale. If we think of each countries labour force as a

siloed mechanism with the main driver of diversity being distilled from physical migration, this holds many challenges from vias requirements right up to housing. By implementing einclusion on a global scale this give organisations access to a talent pool of billions, this of course is not a new phenomenon, but it can be argued that the labour force and society as a whole have only scratched the surface of unlocking the benefits of diversity within the labour force. As the pace of e-inclusion in Sub-Saharan Arica and other underdeveloped regions continues to garner momentum the digital skill gap will not only shrink but also demonstrate greater diversity.

Opportunities for greater access to talent pools and diversification of the labour force is not just on a macro-level, advancements in ICT have also created huge opportunities for further inclusivity on a domestic level, unfortunately these opportunities have yet to take shape in any meaningful way within the disabled community. In the EU only 50.5% of persons with disabilities are employed versus 74.8% of persons without disabilities. Ireland ranks lowest of all EU members states with an unemployment rate of just 32.6% almost 20% lower than the EU average (Disability, 2020) Being employed is an essential element of achieving personal and economic autonomy and with the advancement in ICT and the chronic underrepresentation of persons with disables within the labour market, strategic focus and policy implementation must be directed at this short coming.

There are also gender based disparities within the digital sector which contribute to the evergrowing digital skills gap. Research conducted of a sample size of 552,751 employees across 56 companies observed that only 26.7% of tech roles were occupied by women. What gives cause for further concern is that over the past two years women participation in these roles has decreased by a further 2% (Hubbert, 2024) this decline in participation comes at a time when Accenture estimates that the digital skills gap could contribute to a cumulative lost to GDP growth of £145 billion between 2018 to 2028 – these numbers simply do not align. Governing bodies and institutions, particularly large corporations, must afford greater time and focus so to understand why this trend is continuing and what can be done to rectify the issue. Firstly, the gender pay gap must be reviewed, the unadjusted gender pay gap within the EU tech sector is 25%, meaning women are earning 25% less than their male colleagues on average across all levels within the sector across the block. However, this must be caveated with the fact that the adjusted pay gap is only 2.5% which suggests that there is equal pay for equal work. The stark variance between the adjusted and unadjusted statics is born from the underrepresentation of women within senior roles with only 21% of senior executives being made up by women (Equality, 2020) These findings indicate that strategic policies which holds inclusion and diversity as a core principal need to be embedded into all organisations across the tech sector.

#### 2.5 Online Education as a disruptive innovator

Disruptive innovation is defined as a concept that describes the process where a product or service takes root at the bottom of a market then rapidly advances upmarket eventually displacing established competitors. It is important to distinguish between advancements in technology and disruptive innovations, for example, incremental or even transformative advancements to existing products or services are not considered disruptive innovations, these may include advancement in software or incremental advancement in fuel efficiencies. To be disruptive the product or service must introduce a new technology or service which has the potential to displace or replace an incumbent or lead to market disruptive innovation is not always wise nor visible. Dual transformation allows an organisation or industry to reposition itself today whilst creating opportunity for the future (Leavy, 2017)

It is not the prediction, nor would it be the recommendation of this study, that the education sector adopts a one-hundred percent online model, but rather research the affects and opportunities which have been created due to the emergence of the disruptive innovation that is online education. An assumption or challenge that may be placed at classifying online education as a disruptive innovation is the sectors gradual movement toward this model and therefore may be classed as advancement in technology rather than disruptive innovation. However, such as the working from home model, which was adopted by almost every sector during the Covid-19 pandemic, the advancement in was dramatically accelerated and the pace and adoption of this changes made it disruptive. However, what solidified online education as a disruptive innovator to the education sector is its almost universal adoption and expansion post pandemic, as previously stated in this report the e-learning industry is projected to grow by 20.5% by 2030 and significantly greater number of students are now opting for online education as a viable alternative to classroom learning. As there are limitations with online education particularly for practical subjects such as engineering or medicine, therefore, traditional classroom-based learning will always be required in some capacity. However,

advancements in online infrastructure such as video conferencing and learning management systems have allowed for the creation online classrooms and interactive whiteboards which allow students to collaborate and interact with one another whilst at the same time opening up educational opportunities to a wider demographic as the flexible nature of online learning allows student to participate remotely. (Keller, 2008)

Harnessing online education as a disruptive innovation whilst maximising its potential is still a work in progress and certain pitfalls have emerged, noticeably that in the way of low barrier of entry into the market due to low cost and greater demand for e-learning. Although greater diversity in terms of the product offerings in the education sector may seem positive as it promotes greater inclusion, there remains the risk of reputational damage through providers charging high cost in tuition fees with low learning outcomes. Awarding bodies are in place across the United Kingdom and EU to ensure adequate standards of education levels are delivered for all accredited institutions. Consideration must also be given to the fact that although the infrastructure can now accommodate online learning, the teaching professionals also need to be adequately supported to ensure the delivery of education is at the same standard to that given in a traditional classroom base setting.

# **2.6** Conclusion

In conclusion, it is apparent that a digital skills gap does exist, and it is not refined to one sector, demographic or location but a universal issue. Existing research on this topic is relevant when charting the correct course of action to harness the potential of online education as a method of closing, and eventually meeting the digital skill shortage. As demonstrated within the literature review of this report, this storage will not be met without comprehensive training and upskilling of the existing labour force and improving the collective digital competency and proficiency of all those which require it.

The next chapter outlines the data collection in relation to the research question in this research.

#### **Chapter Three: Methodology**

## **3.1 Introduction**

Albert Einstein famously once said "not everything that counts can be counted" this rings true when undertaking qualitative search. This chapter serves the purpose of outlining the strategies used for data collection with an aim of addressing the research question which will be investigated. The aim of this research is to clearly demonstrate both the opportunities and perils of effectively addressing the digital skills gap and how online education may influence the addressing of the issue. The research and objectives in this research are exploratory in nature and therefore a qualitative approach has been undertaken. Furthermore, an inductive thematic analysis will be conducted within the research with Interpretative Phenomenological Analysis (IPA) applied to given greater understanding to its findings. Data for this research has been collected in the form of an online questionnaire and has been directed towards current students, perspective students, as well as alumni. The rationale for selecting participants with prior knowledge of both classroom and online learning is to garner a more in-depth understanding of the research question. This selection of participants also justifies the selection of a thematic analysis as it is widely deemed a suitable fit for exploring participants experiences and perceptions. However, as described by Lorelei Lingard "quotes can be the life's blood of your qualitative research paper. However, they are the evidence, not the argument" (Lingard, 2019) this statement is relevant to this research as it's focuses on data interpretation and how effective research must draw connection between respondent's experience, which in this case, the wider educational trends.

#### 3.2 Rationale

The purpose of the research question will be to determine from a student perspective what the challenges and opportunities with online education are and if it is indeed a viable solution to meet the digital skills shortage. The questionnaire will be open ended comprising of nine questions and an opportunity for further discussion and feedback at its conclusion. The rationale for framing the questions in such a manner was to induce critical thinking and discussion from its respondents. The structure of the questionnaire was broken out into five section which strategically positioned to reflect the literature which was covered in the previous

chapter. These five sections went sequentially by (1) barriers to entry within the digital sector (2) Perception of online learning (3) Addressing the digital skills gap (4) respondent's perception of Artificial Intelligence within the digital sector (5) Diversity and inclusion within the digital sector.

#### **3.3 Research Question**

The review of literature, in the previous chapter, highlights and empathises response required for reskilling and upskilling the labour force to an adequate level of digital proficiency. The emergence of online education is not the topic of this research, but rather its effectiveness and ability to close the digital skills gap. Closing the digital skills gap should not be considered the overarching goal, this must run in tandem with *how* we close the gap. As stated in the introduction to this research, on a societal front, a paradigm shift is underway in how we work and communicate with one another. This paradigm shift means that in human history there has never been a greater time for promise or potential peril, this peril is underscored by the EU's declaration which states that only 20% of ICT specialist are women and that 90% of jobs will require some level of digital proficiency by 2030 (Union, Plugging the digital skills gap, 2024) on a societal front, if this trend is allowed to continue, and widen, up to and beyond 2050 social imbalances and divisions, but rather investigate if online education the disruptive Innovator which is required which for addressing the digital skills gap, the research aims to answer the following questions:

- 1. What is the perception of online learning and its effectiveness.
- 2. What are the perceived benefits and challenges with online learning
- 3. What is the importance of ensuring diversity and inclusion within the digital economy.

This research question aims to gain insight into the consequences of both action and inaction in addressing the digital skill gap as well as the perception of learners and their willingness to adapt to online education. It is hoped that the result of this research will not only provide insight, but I'll be used as a catalyst for further research on this topic and in this field.

### 3.4 Methodological Approach

Thematic Analysis (TA) is applied to decipher patterns and themes from respondents' answers within the questionnaire for this research. This methodology allows interpretation of the data collected to be easily categorised, highlighting key themes within its findings while giving insights into participants perpectives through disclosing underlyings themes within the data. Furthermore, Inductive TA methodoly was applied to the data which took a bottom up appraoch when analysis, meaning it's findings are not shaped by exsisting reseach or theories (Virginia Braun, 2013) Once the themes and patterns withinn the data have clearly been decipher the methodolgy moves onto Interpretative Phenomenological Analysis (IPA) There are clear distinctions between TA and IPA, namely that TA is a broad approach used for identifying, analysing, and reporting patterns. IPA, however, is traditionally used as an idiographic approach focusing on the lived experiences and the meanings respondents attach to those experience, this is the phenomenological aspect of the research i.e. the study of experience. For the purpose of effectively applying IPA to this research a dual interpretation 'double hermeneutic' is applied. Firstly, through hermeneutic of empathy which entails the research representing the data in a way which is both true and reflective of the respondent's experience. Also, part of the IPA, the data is viewed through a critical lens allowing the research to understand what assumptions are made on behalf of the respondents and underpinning why their experience have been interpreted in such a manner, this is described through hermeneutics of suspicion (Virgina Braun, 2013) Dual hermeneutics allows the research to apply both empathy and critical evaluation to its findings.

#### 3.5 The Research Item

The research item was a simple online questionnaire (Appendix 1), which had the following questions:

**Q.1:** What do you feel are the biggest barriers associated with up-skilling digital proficiencies? This question is positioned as being deliberately broad in nature so to elicit a wide-ranging response from the respondents. Barries with upskilling may be subjective to each individual therefore the question is designed to get a better understanding of each respondent's interpretation of the biggest barriers associated with joining up skilling

**Q.2:** *What, if any, benefits do you associate with online learning?* The classification of disruptive innovation requires the innovation to have the potential to replaces it's incumbent. As demonstrated in chapter two of this research, online education stands up to scrutiny when determining if the innovation is disruptive or not. Therefore, understanding the perceived benefits of online education is key to understanding its effectiveness which is at the heart of the research question.

**Q.3:** *What, if any, challenges do you associate with online learning*? As the effectiveness of online learning lays at the heart of the research question, any perceived challenges need to be understood at both an institutional and governmental level. Understanding the challenges will give greater insight to its effectiveness.

**Q.4:** *What, if any, would be your greatest concern in participating in online learning*? Question three and four are designed to provoke contrasting responses from respondents. Challenges and concerns are two distinct matters which aim to be addressed within the research question. Understanding the challenges seek to explore the effectiveness of online learning while concerns aim to determine what's most important to the learns and participants of online learning.

**Q.5:** What do you feel are the main drivers behind the widening of the digital skills gap over the past decade? The basis of this question is quantifying the respondents understanding of the drive factors driving the digital skills gap. A singular response holds little merit; however, the collective response of all respondents will allow for an understanding of the wider perception of the driving factors of the widening gap

**Q.6:** What do you think are the most urgent issues that need to be addressed in order to meet the digital skills gap? There are many issues within the digital skills gap therefore understanding the urgency of each gives greater understanding to the research question. As stated in chapter two there are large sections on society that do not have access to stable internet connections, there is also unbalanced representation within the sector, exploring these issues is the basis and justification for this question.

**Q.7:** Do you believe that Artificial Intelligence (AI) within the digital skills sector is a cause for concern or opportunity, discuss: As demonstrated within the literature review of this research, AI has given rise to both optimism and concern from employee to employer, and from student to alumni alike. This cloud of uncertainly may foster a *wait and see* approach from perspective student as any education undertaken in the short term may be rendered obsolete in

the medium to long term, such is the advancement within AI. This question holds significant weight when evaluating this research question

**Q.8:** What do you believe is the most effective method of ensuring inclusion and diversity within the digital skills sector. Understanding if online education is the disruptive innovation which is required to close the digital skills gap is the premiss of this research question. However, exploring the opportunities that online education holds as a vehicle of driving greater diversity and inclusion into a sector is an important feature of not just the research question, but of the research in its entirety.

**Q.9:** *Is there anything else to discuss or further comment you would like to make on this topic?* Understanding the limitations of this questionnaire while also conducting interpretative phenomenological analysis, it was pertinent seek further discuss on topics which could enhance the findings of the research which were acquired through respondents lived experiences.

This research item was first shared amongst a controlled sample of students who are undertaking their Master in Business Administration. The purpose of this control test was to garner feedback on the questions and the practically of the questionnaire itself. This was found to be a productive exercise as the feedback was that the questionnaire was too long and some questions seemed ambiguous, in response to this feedback the questionnaire was reduced from fifteen questions to nine and some questions rewritten.

#### 3.6 Research Sample

Like any qualitative research the sample of the research group was determined on three key principles, (1) how much data will be required to acquire accurate findings, (2) what method of recruitment will be use (3) and most importantly, what sample will be most appropriate to answer the research question and the theoretical aims of the study. Various methods of sampling may have fit for this research question; however, purposeful sampling was considered to be the method of best fit. Purposeful sampling entails intentionally selecting a sample of participants based on a specific criteria, in this instance exposure to both classroom and online education, the strength of purposeful sampling as a best fit for this study allows the research to gather indepth information from individuals who has lived experience (Palinkas, 2013) Concerns with the subjectivity and bias in the interpretation of the findings is a concern when applying

purposeful sampling. The intended audience was directed towards learners who have undergone, undergoing, or have completed further education. This was achieved by publishing an online questionnaire into a *Slack* community of eight-thousand members of an online educational provider. The community consisted of learners currently involved in the online learning as well as alumni of that same educational provider. Furthermore, the questionnaire was also shared on the social media platform, LinkedIn, and was directed towards a community of classroom-based learners from a third level institution. It is the hope and aim of the research that purpose sampling with both in classroom based and online leaners will allow for in-depth experience gained whilst targeting two separate groupings from online and in classroom learners will help mitigate any self-selection bias, this issue will be explored further under the limitations sectors of this study.

## **3.7 Ethical Considerations**

Implementation of ethical considerations not only ensures the trust between the research and the respondents but also contributes to the integrity and validity of the research and its findings. 'Sound research is a moral and ethical endeavour and should be concerned with ensuring the interest of those participating in a study are not harmed as a result of the research being done' (Halai, 2006) As shown in consent form within the questionnaire (Appendix 2) informed consent was gathered and respondents were made aware of the purpose of the study and the purpose for gathering the data. Anonymity and confidentiality are a key consideration of the research with no distinguishable data requested as part of the questionnaire. The questionnaire seeks information which is pertinent and within the scope of the research, all respondent's anonymity was ensured throughout the collection of the data as well as a confirmation of a right to withdraw content at any time. As the questionnaire is directed towards learners with experience in further education the ethical considerations of those under eighteen did not feature within the study and therefore no consent form was required.

All research carried out at the National College of Ireland requires all students to undertake an Ethic module before conducting any research. This module is mandatory and data collection cannot be undertaken until is it complete with a passing grade. Research commenced after 20<sup>th</sup> of November 2023 once the module was completed with a passing grade.

### 3.8 Limitations

Limitations require a critical, overall appraisal of the study and its impact. Identifying and acknowledging the limitations within a study in no way diminishes it's finding, providing justification, mitigation and reasoning for the limitation can be identified. A limitation which has been identified as part of this study is self-selection bias. This limitation does not render the study irrelevant or its findings inconclusive but are rather an important declaration to include within the study to ensure transparency and integrity. Swiss author and businessman Rolf Dobelli defines self-selection bias a 'tendency of people to choose to be part of a group or study based on their own characteristics, which can lead to skewed results' (Dobelli, 2011) It was therefore imperative that this study could be conducted with purposeful sampling which allowed greater in-sight through lived experience whilst overcoming any chance of self-selection bias for respondents. If all questions were derived from respondents from online education, the likelihood is that the findings would show a more favourable view of online education even though this view may not be representative of the population.

A lack of mitigation or absence in transparency of reporting can have profound consequences to research and its findings. In this case, the mitigating factor was to seek contrasting views from both classroom and online learners alike.

## 3.9 Approach to Data Analysis

The research item was posted within the Slack community and on LinkedIn for an equal period of time, ten days. Once the questionnaire was removed and no further respondents were accepted, the data was then analysed. As part of the inductive thematic analysis, statements and quotations were examined from each respondent, searching for common key words and patterns within the responses. These patterns were then broken into distinguishable codes which would go on to form the themes identified within the study. Finally, each theme was broken down for interpretation and conceptualisation to gain greater insight into the research question and the theoretical aims of the study.

Furthermore, as discussed under the methodology section of this report, interpretative phenomenological analysis was implemented from an Idiographic lens to help understand respondents lived experience, whilst the interpretative nature of the finding is also discussed, evaluating the researcher conceptualisation of the findings and its relevance to the overarching findings of study.

The data was analysed in collaboration with the research question and literature which was reviewed in chapter two of this research. The aim is also to allow the findings of this study to be criticised and built upon for further research.

# 3.10 Conclusion

This chapter outlined the research study in relation to its undertaking and overarching paradigm. The collection of data and the subsequent analysis was positive, which allowed room critical thinking, open discussion, and opportunity for further expansion on the research topic. Understanding perspective learners and their comprehensive of the digital skills gap and online education is key to understanding if online education the disruptive Innovator which is required which for addressing the digital skills gap.

#### **Chapter Four: Data Analysis & Discussion**

#### 4.1 Introduction

In this chapter, the data collected by the questionnaire will by analysed and discussed with an aim of answering the overarching research question, is online education the disruptive innovator which is required which for addressing the digital skills gap. This is analysed from a learner's perspective which will lead the discussion to be centred around three sub question

- 4. What is the perception of online learning and its effectiveness.
- 5. What are the perceived benefits and challenges with online learning
- 6. What is the importance of ensuring diversity and inclusion within the digital economy.

It is the aim of this research that deriving understanding of these three questions will allow the study to make clear findings and recommendations on the research question and allow for further study to be conducted on this topic. The results of the inductive thematic analysis will be displayed in a table so to clearly demonstrate the intrinsic link between respondent's statements, the highlighting of key words, the codes in which they have been deciphered into, and finally the themes which will underpin the interpretation and conceptualisation of the findings. The study will then move into an interpretative phenomenological analysis, before moving into the discussion sector of the study where its strength and weakness will be analysed with comparison to similar research with was conducted in the field. The research instrument i.e. the questionnaire can be found in the appendix.

#### 4.2 The Research Findings

The research findings are outlined in a table with colours assigned to each keyword so to clearly demonstrate why each keyword is associated with certain codes and themes. The research investigates eleven keywords and statements which are branded into six codes and three themes. Each question in the research item was designed to elicit a response that could further investigate one of the three sub research questions which would ultimately allow the research to make findings and recommendations based on respondent's answers. The themes associated with each code were not predetermined and changed several times as more respondents engaged with the questionnaire and further analysis was conducted.

Using thematic analysis, the first theme which was identified was Guidance, it shows that learners have reservations regarding their own motivations and self-discipline for completing online learning. The findings also show a perceived lack of supports and communication with online learning, for the purpose of this research this feedback was broken down into two separate codes, Direction (motivation & self-discipline) and Learning Supports (supports and communication) which have both been branded as a theme of *Guidance*. The next theme which was identified was, Trade-Off. Interestingly, the term trade-off did not appear within the respondent's feedback. This was however evident through the continuous mention of interaction and community, or the lack of it, which was therefore associated with the code 'Diminished Sense of Community' Conversely, under the theme of Trade-Off is the code of 'Flexibility' which appeared nine times in the respondent's feedback which made it the most used term within the research findings. Both diminished sense of community and flexibility make up the theme of trade-off. The final theme which was identified within the research was 'Road Map to Change' respondent's feedback was coded into 'Solutions' and 'Responsibility' an interesting point of note from the respondent's feedback is that in several instances respondents cited a lack of opportunities for minorities within the digital sector which reenforces the findings that were discussing within the literature review chapter of this research. Respondents also placed the onus of change onto organisations to cater for more opportunities for minorities within the sector, it is for this reason that the theme was titled 'Road to Change'

# **Research Table 1**

Statement/ Quotations	Keywords	Codes	Themes
"I think the biggest challenge was making a schedule and sticking to it without procrastinating. Having completed the majority of education in person, I also felt that there was less of a support network online, and it requires a greater degree of motivation. Additionally, access to module coordinators being through email can create difficulties regarding times frames for questions being answered" "Lack of interpersonal development for some, interaction and interest reduction due, varying standards of delivery, distraction and attention, motivation" "Self-discipline: Requires a high level of self-motivation and discipline. Self-resilience is a big challenge. Self- discipline and belief is required to motivate and get through the inevitable ups and downs. Isolation can be an issue. This can be countered with strong online communities.	Motivation, Self-Discipline	Direction	Guidance
Making connections with peers can be difficult, and for those that don't have determination and Self- discipline, it's harder to keep yourself on track - especially with self-learning and having no deadlines set (usually the cheaper alternatives for coding bootcamps)			
"Technical Issues: Learners might face difficulties with online platforms or have inadequate technical support". "Sometimes face to face communication helps - even with video calls, it's not the same"	Support, Communication	Learning Supports	Guidance

"Difficulty in getting support when not face to face			
"Lack of community, less social interaction with peers, potential lack of supports"			
Sometimes there can be communication difficulties that arise from lack of in person connections			
"Lack of Interaction: Limited face-to-face interaction with instructors and peers can hinder learning for some"	<mark>Interaction</mark> , Community	Diminished Sense of Community	Trade- offs
"Lack of interpersonal development for some, interaction and interest reduction due, varying standards of delivery, distraction and attention, motivation"			
"Lack of community, less social interaction with peers, potential lack of supports"			
"The challenges associated with online learning include the lack of face-to-face university experiences and a diminished sense of <b>community</b> "			
"Reach out to the community - there is a strong demand for face-to-face support for people who are getting started with digital. From that start, learners can progress to an primarily-online learning mode			
"Lack of support, lack of community, difficulties speaking with a real person if I get stuck"			
<b>Accessibility</b> : Learning materials are often available to anyone with internet access, breaking geographical barriers"	Accessibility, Flexibility	Flexibility	Trade- offs
"Flexibility: Learners can set their own pace and schedule, which is particularly beneficial for those with busy or irregular schedules."			

"Accessibility improved for those living remotely, time saving, scalability" Flexibility is key. It is very difficult to talk about any significant full-time learning from a full-time job. Very few employers give this space. With rental prices soaring it is becoming increasingly difficult for students to reside close to a physical campus. "Online learning includes easy accessibility, flexibility, and improved time management."			
"Greater access to online education for all demographics, greater employment opportunities implemented by organisations within the sector" "Outreach Programs: Targeting underrepresented groups with specific initiatives to encourage participation in digital skills training. Scholarships and Financial Aid: Providing financial support to those who need it. Mentorship and Support Networks: Creating supportive communities and mentorship opportunities for learners from diverse backgrounds. Inclusive Curriculum: Developing curricula that reflect a diverse range of experiences and perspectives" "I believe greater opportunities for women in tech as well as minorities. Leadership needs to be shown but governing bodies and large institutions"	Opportunities	Solutions	Road Map to Change
"The lack of digital education within primary and secondary level education in Ireland and the lack of diversity within the sector" "The most effective method for ensuring inclusion and diversity within the digital	Diversity, Organisations	Responsibility	Road Map to Change

skills sector is increasing industry awareness about the importance of a diverse workforce and improving access to education for minority groups"	
If you want inclusion and diversity you have to live it within the company values. A true understanding of different people's values, cultures and beliefs is important in modern day working - and this needs to translate well into the company culture. A list below:	
A mixture of things, the acceleration of digital technology in an ageing workforce, managers and senior people in organisations not acknowledging the changing environment, and the inaccessibility of learning, whether through practices, sexist attitudes, bigoted attitudes, or physical location, etc.	
Greater access to online education for all demographics, greater employment opportunities implemented by organisations within the sector	
Connect with organisations that specialise in maximising inclusivity, take on board what is being said and incorporate it. While doing that, reach out to marginalised groups, there are so many out there, that with a little help would make amazing advocates.	

## 4.3 Thematic Analysis

Inductive thematic analysis was defined by Braun and Clarke as a method for identifying themes and patterns of meaning across a dataset in relation to a research question. The aim is to generate an analysis from the bottom (the data) up, the analysis us not shaped by existing theory, although analysis is always shaped to some extent by the researcher's standpoint, disciplinary knowledge and epistemology (Virginia Braun, 2013) The thematic analysis for this research is no exception as a bottom up approach was adapted when analysing respondents feedback. This section will now discuss the findings of each theme.

The first theme identified through thematic analysis is guidance. This was derived from what respondent's cited as a lack of motivation and self-discipline. Due to a lack of face-to-face interaction, some students find it difficult to meet deadlines or attend classes, this has been cited in previous studies as a lack of accountability as the student does not need to be physically present to account for his/her progress (Maina Elizaphan Muuro, 2014) The assumption that the traditional bricks and mortar, educator at the top of the classroom, style of education offers more direction and guidance for learners is a belief that is widely held. The results from this research support the conclusion that learners do have challenges with motivation and selfdiscipline and that further guidance would be desirable. Researchers and educators have attempted to overcome these barriers with new innovative approaches to learning, one of which is gamification. This entails a more practical approach to learning allowing learners to better engage with their lesson plans through greater interactions and engagement. Gamification may not be a viable option for all modules or courses but it's innovated method of delivering education highlights the recognition of educational providers that new and innovative approaches are needed to ensure greater guidance for learners through direction and learning supports (Webster, 2024)

The second theme which was identified as part of this research was the trade-offs in benefits between online and classroom-based learning. Arguably one of the most conclusive theme within the findings due to the frequency in which it appeared, the trade-off in benefits will ultimately determine if is online education the disruptive innovator which is required which for addressing the digital skills gap. If the perceive benefits are more favourable toward classroom-based learning it therefore means that online learning does not process the ability to replace the incumbent and therefore cannot be considered a disruptive innovator. Benefits however are subjective by their nature and value will always be in the eye of the beholder, it was therefore

essential for the reliability and credibility of this research that the sample population was directed toward learners with experience of both online and classroom-based learning, the theme of 'trade-off' is representative of this. What must also be considered is the scope of the research question, the question is not if online learning will completely replace classroom-based learning, but rather if it will be required to meet the needs of the digital skills gap. Corporate strategies have already undergone transformational change to accommodate the upskilling of employee's digital proficiencies, in most instances the upskilling must be completed in tandem with existing work commitments and obligations, it is therefore essential that flexibility and accessibility is at the heart of this. This enhanced flexibility comes in the way of online learning platform such as eLearning industry, Udacity and LinkedIn Learning to name a few. There are also corporate training programs and platforms for digital adoption (DAPs) which are forms of effective online learning with flexibility at its core (Dorlevi, 2024) It must however be expected that each method of delivery, be it online, or in person, will hold it's own merits and advantages.

The third and final theme explored in the findings of this research was deciphered from two codes, solutions, and responsibility. These two codes created the theme of roadmap to change. This theme was named due to the unprompted solutions which were outlined by respondents, the majority of which criticised organisations for the lack of opportunities afforded to minorities and females within the sector. The lack of representation for minorities was outlined with the literature review in chapter two, however, what was interesting to see from the findings of this research is that this sentiment exists amongst the majority of respondents. Under the code of opportunities respondents also felt that the lack of roles models and senior executives from minority backgrounds showed little pathway for new entrants into the sector. This poses significant challenge when it comes to adapting or implementing any meaning changes, if perspectives learners are deciding on a career within the tech sector or upskilling with their current roles and cannot see any clear path forward for progression, the likelihood is they may decide to purpose another career. However, governing bodies and organisations have recognised the issues at hand which previous studies within the field can verify. The Tech Talent Charter conduct an annual report tracking diversity in the technology sector, it's findings found that 82% of respondents said gender was one of the top two priorities when hiring whilst 58% of respondents cited ethnicity as a priority (Charter, 2020) From the findings of this research and the subsequent study within the field, a fair conclusion to be reached is that a there is an issues with inclusion and diversity within the digital skills sector which has led to the

responsibility being placed at the door of organisations, there are however concerted efforts underway to correct the imbalance.

# 4.4 Interpretative Phenomenological Analysis (IPA)

IPA is phenomenological as it is concerned with how people perceive and make sense of their lived experience and how participants make sense of personal and social environment. A dual hermeneutics allows the research to apply both empathy and critical evaluation to its findings, this approach was taken in the table below. As seen within the appendix, the final question within the research item allowed for more opened ended discussion allowing the respondent highlight or discuss any relevant information they felt was not adequately covered or disclosed within the research item. The responses of this question "*Is there anything else to discuss or further comment you would like to make on this topic*" are outlined in the Statement / Quotations box in the table below.

# **Research Table 2**

Statements / Quotations	Exploratory Comments	Critical Evaluation	
"Although digital skills gap	An underlying sentiment	Learner's expectation when	
still exists, the emergence of	across many sectors is both	entering the tech sector need	
AI and the lucrative	the threats and opportunities	to be assessed. The digital	
opportunity within the sector	posed by AI. Entrants into	skills gap cannot be filled	
means the more high paying	the tech sector expect "more	through inflated salaries, this	
roles are becoming	high paying roles" which is	model would be	
competitive"	now clouded in uncertainly	unsustainable and would lead	
	until there is more clarity	to a collapse within the	
	around the capabilities of AI	sector.	
<u>"I'd say that Online</u>	This respondent states that	"Choice is always a better	
Learning is no longer a	online leaning was once a	thing" although this may	
disruptive innovator - it's	disruptive innovator but is no	seem like an obvious	
part of the course in modern	longer. This indicates that	statement it may not be the	
learning opportunities. It's	this respondent believes	case. Other respondents have	
now also key to the digital	online learning has been	criticised the saturation of	
skills gap because it gives	successfully embedded as a	the online education market	
people more options to learn	viable method of delivering	and the lack of regulation.	
and learn in a way that they	further education.	Further guidance may be	
want to. Some people want a	Furthermore, the respondent	needed to believe assist	
university degree, some want	acknowledges that three is no	learners	
to go to a college. Some	one size fits all approach to		
people don't want either of	meeting the digital skills gap		
those or online learning	and that more method of		
provides that for those	delivery will be requires, this		

people - with numerous options available. More choice is definitely a better thing, so is more than definitely required - and ultimately will help to close	this report has also found within its findings.	
the digital skills gap" "It seems the industry of online education is void of any real regulation, I've since some expensive courses with really poor reviews but they seem to be getting away with it"	Lack of guidance, or a belief in a negative return in both a time and/or financial commitment will not only hinder new entrants into the sector but also cast doubts on the existing workforce attempting to upskill or reskill.	As highlighted in chapter two of this report, regulatory bodies are in place both from national governments and blocks such as the EU. Getting this message across to perspective learners however seems to be a challenge. What is particularly worrisome is the comments of "getting away with it" this indicates a complete lack of trust with the sector which most likely
"The digital skills gap is a complex issue that requires a multifaceted approach. Collaboration between all stakeholders—educators, industry leaders, policymakers, and learners— is crucial. It's also essential to foster a mindset of continuous learning and adaptability to keep pace with technological advancements"	Acknowledgement of a holistic approach needed to me the needs of the digital gaps, and the first mention from all respondents of "continuous learning"	Acknowledgements of this nature contextualise the challenge in addressing the digital skills gap and the requirement of all stakeholders to collaborate to meet a common goal.

The contrasting views of respondents gave a more holistic and creditable view to the analysis. No delivery method or experiences will completely align with all learners. It is therefore critical to explore contrasting views and experience so to get a more nuanced understanding of the research topic. The final respondent, which is highlighted in blue, gave perhaps the best synopsis of the challenge ahead, identifying the imperative requirement for collaboration and fostering a mindset of continuous learning.

# 4.5 Conclusion

Using both inductive TA and IPA allowed the research use two distinguishing methods of qualitative research to get a more nuanced and in-depth understanding of respondent's sentiment, perception, and lived experience of further education. This understanding is then critical to determining if online education is the disruptive innovator which is required for addressing the digital skills gap. What is evident from the findings is, although challenge have been identified within the sector, be it the lack of digital proficiencies within the workforce, underrepresentation of minorities in senior positions, or the uncertainty of the emergence and capabilities of AI, changes are gradual, and expectations must be managed both from and individual and organisational perspective. What can be actionable with quick implementation are clear and coherent roadmaps on how to overcome these challenges.

The next chapter will conclude this study, and also suggest some recommendations for further studies for research in this area.

#### **Chapter Five: Conclusions & Recommendations**

#### 5.1 Conclusion

The literature review of this research has demonstrated the need for greater access for further education to enhance the digital proficiency on a global stage while also highlighting the need for a multifaceted approach for further education for new entrants into the sector as well as the capacity to upskill the existing workforce. Goals which have been set out by the EU for 2030 include 90% of adults must be equipped with a basic level of digital proficiency, twenty million ICT specialists employed across the block with a gender balance, and 75% of EU companies using cloud computing / AI / big data technologies (Pouliakas, 2022) This study has demonstrated that these targets cannot be achieved by relying exclusively on the skills of the future workforce, so to achieve targets from 2030 and beyond, a clear roadmap needs to be implemented from local SME's right up to large trading blocks like the EU and everyone in between.

The research within the literature review of this study is widely known, the question is not the existence of a digital skills gap, but how is it effectively going to be resolved. As shown in this study, innovative approaches have been taken by educators and organisations alike to better deliver further education for digital skills, yet the skills gap continues to widen. This research has also demonstrated the requirement for expectations to be managed both from an employee and employer perspective. Morgan McKinley have cited one of the key factors in inflated salary within the tech sector is a simple supply and demand issue, there simply isn't enough skilled workers to fulfil the roles on offer. The 2024 Technology Salary Guide published by Morgan McKinley cautions employees within the tech sector, that as greater focus is placed on closing the digital skills gap, the supply and demand issues employers are experiencing will diminish, in such employee bargaining power for high-end salaries will decrease. The Report also goes on to caution employers, citing the challenges in closing the digital skills gap and until these challenges are met, employers will have to continuing paying high-end wage packages to attached and retain top talent (McKinley, 2024) Both these warnings hold relevance to this research and its conclusion, as salary expectations and opportunities for future employment feature heavily within respondents feedback within the research item. The report also heeds warning on the challenges of closing the digital skills gap, something which is a key focus of this research.

This research has highlighted that the issue of digital proficiencies can be remedied, but significant time and financial investment will be required from all stakeholders as well as the political will to action the necessary changes to meets the targets for 2030 and 2050 respectively, both of which have been outlined in this research.

# 5.2 The Research Question

This research study aimed to seek answers three questions:

- 1. What is the perception of online learning and its effectiveness.
- 2. What are the perceived benefits and challenges with online learning
- 3. What is the importance of ensuring diversity and inclusion within the digital economy.

The reasoning behind answering these three questions was to ultimately determine if online education the disruptive innovator which is required which for addressing the digital skills gap. The findings of this study would suggest that the perception of online learning from a student perspective is positive but still remains uncertain. Respondents to this research still seem to hold some distrust towards the learning outcomes and employment opportunities from online learning.

The perceived benefits and challenges with online learning was lay bare throughout the TA analysis within chapter four of the research. The trade-off between accessibility and flexibility with learning supports and community is still a challenge that learners are battling with. This however is not a negative result as it's to be expected that individuals learn at different paces and different learning styles. These finding are however relevant for online education providers if they wish to ease the concerns of learners by improving learning supports and grow their online communities.

The final of the three sub questions of this research which addresses the importance of ensuring diversity and inclusion within the digital economy may be the most conclusive. The reason for stating that it is the most conclusive is the agreement from different resource within the literature review of its existence and the collective agreement of the requirement for action on the matter. Respondents within the research item also collectively agree of the existence of

underrepresentation within the sector and the requirement for action on the matter if the challenges with closing the digital skills gap are going to be adequately addressed.

Taking the three sub questions into consideration, it is the conclusion of this research that online education is indeed a disruptive innovator which is required which for addressing the digital skills gap, however, it is not a standalone solution. Learners have not entirely bought into online education and therefore, equal or greater reliance will be required from traditional delivery method of education. Furthermore, greater investment is required for better signposting and guidance for learners within the realm of online education. Based on the findings of this research, and the trajectory of online education over the past decade, it is the estimated outcome of this research that online learning will continue to take up greater market share within the further education sector, however, the pace of which will not satisfy demand for digital skilled workers to the meet the digital skills gap.

#### **5.3 Recommendation for Future Research**

Future research in this area is absolutely required for a more in-depth analysis and understanding of this topic. This research predominantly targeted the perception and understanding of the digital skills gap and online further education from the perspective of learner. The justification for this approach is validated through its findings, however, the study was one dimensional as the research item was directed exclusively towards leaners.

Further research on the same topic from an employer's perspective is needed. This could include both qualitative and quantitative research focusing solely on employers and their requirements for meeting the digital skills gap. It is the believe that the digital skills gap will be transitory, therefore further research on its conclusion it's also advised. As discussed in the introduction to this research, society has adapted to the agricultural, and industrial revolutions, the technological will be no different, it's just a matter of how and the pace in which it is concluded.

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# Appendices

## **Appendix 1 – Research Questionnaire**

# Is Online Education the Disruptive Innovator which is required for addressing the Digital Skills Gap

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This survey is part of a research project which is being conducted to gain a greater understanding of respondents' knowledge and perception of the digital skills gap and online education. The research question of *"Is online education the disruptive innovator which is required for addressing the digital skills gap"* will be the central focus of each question. Each question holds meaning and relevance to addressing this question. At any point while completing the questionnaire, or once feedback has been submitted, each respondent will have the right of withdrawal and for their feedback to be removed from the research. No identifying features such as name, date of birth, address, or occupation is required or will be shared. By completing this survey, each individual is agreeing to their feedback being analysed and used as part of the research. Upon completion, I am happy to share all finding with each respondent.

:::

What do you feel are the biggest barriers associated with up-skilling digital proficiencies

Long answer text

What, if any, benefits do you associate with online learning

Long answer text

What, if any, challenges do you associate with online learning

Long answer text

What, if any, would be your greatest concern in participating in online learning

Long answer text

What do you feel are the main drivers behind the widening of the digital skills gap over the past decade

:::

Long answer text

What do you feel are the most urgent issues that need to be addressed in order to meet the digital skills gap

Long answer text

Do you believe that Artificial Intelligence (AI) within the digital skills sector is a cause for concern or opportunity, discuss:

Long answer text

What do you believe is the most effective method of ensuring inclusion and diversity within the digital skills sector.

Long answer text

Is there anything else to discuss or further comment you would like to make on this topic

Long answer text

# Appendix 2 – Submission of Thesis and Dissertation

Submission of Thesis and Dissertation

National College of Ireland Research Students Declaration Form (*Thesis/Author Declaration Form*)

Name: Adam Rooney Student Number: X22144099 Degree for which thesis is submitted: Masters in Business Administration Title of Thesis: 'Is online education the disruptive innovator which is required for addressing the digital skills gap' Date: 07/08/2024

# Material submitted for award

- A. I declare that this work submitted has been composed by myself.  $\checkmark$
- B. I declare that all verbatim extracts contained in the thesis have been distinguished by quotation marks and the sources of information specifically acknowledged.
- C. I agree to my thesis being deposited in the NCI Library online open access repository NORMA. ✓
- D. *Either* \*I declare that no material contained in the thesis has been used in any other submission for an academic award.
  Or \*I declare that the following material contained in the thesis formed part of a submission for the award of

(State the award and the awarding body and list the material below)