



## Developing New Learning Technologies

Digital badge credentials in the Irish food and agri-food sector

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Taste 4  
Success

Skillnet



UCC

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A close-up photograph of a chef's hands seasoning a salmon fillet. The chef is sprinkling salt from their fingers onto the fish, which is resting on a wooden cutting board. The background is blurred, showing a kitchen setting. The entire image has a green color overlay.

**The manufacture of food and drink products is Ireland's largest indigenous sector with 230,000 employed.**

## FOREWORD



**T**he manufacture of food and drink products is Ireland's largest indigenous sector with 230,000 employed. While the longer-term opportunities largely remain positive for the Irish food and agri-food sector, the immediate response must be to ensure it is fit for purpose to meet the substantial challenges ahead including the impact of Brexit. This brings into sharp focus the need to ensure the necessary policy measures are implemented so that the Irish food and agri-food sector is highly cost competitive, productive and innovative. A key factor in achieving this is access to a skilled and motivated workforce.

Recent Irish economic recovery and increased job creation across the economy has resulted in some companies within the food and agri-food sector facing considerable challenges to attract employees into all available positions, particularly into general operative roles. There is a need to ensure the skills base reflects not just the current business demands but the challenges of future growth in existing and new markets.

Skills are a fundamental pillar for the food, agri-food and beverage sector as enterprise works together to fill key skill gaps identified by those working in the industry and to meet the targets of Food Wise 2025. Taste 4 Success Skillnet and other Skillnet networks make significant investments in developing the skills and competencies of those working in this sector. This study considers the adoption and use of micro-credentialing through digital badges within the food and agri-food sector context. It examines the value this may bring to competency based further education and training and lifelong learning within a workforce development context.

I would like to acknowledge all of those who contributed to this research report. Particular thanks are due to the many enterprises, employees and stakeholders who contributed their time and efforts. I would also like to express my thanks to the Food Industry Training Unit, at University College Cork and Dr Amy-Jane Troy. Finally, I would like to thank the Taste 4 Success Skillnet steering group and co-author Bridie Corrigan Matthews for managing and leading this innovative study to a successful conclusion.

**Paul Healy**  
Chief Executive  
Skillnet Ireland

## EXECUTIVE SUMMARY

**Taste 4 Success** Skillnet’s mission is to drive increased participation and learning throughout member companies in the food and agri-food sector. We identified an opportunity to further develop, enhance and recognise the learning and upskilling of employees working and operating in this sector. At the time of this research report, digital badges have not previously been developed for the food and agri-food sector in Ireland. This reflects the international experience whereby the sector is currently at initial stages of digital badge credential recognition.

**This research study is the one of the first to consider the specific needs of one of Ireland’s largest and most significant indigenous sectors. It is also the first to develop and provide digital badge credentials through a third level academic institution to this sector on learning interventions for enterprise.**

The aim of the research study was to identify and explore the opportunity to develop digital badge credentials for non-accredited programmes undertaken by member companies and employees in the food and agri-food sector and to examine the potential for future adoption of these.

During the third quarter of 2018 Taste 4 Success Skillnet commissioned a research study into the relevance and opportunities offered by leading-edge and advancing learning technologies in recognising learning and development in Ireland. The research considered the latest world trends on digital badge credentials, as well Ireland’s status in using this technology.

### New digital badges for the food and agri-food sector

In partnership with the Food Industry Training Unit at University College Cork, the research study focused on the potential impact and value that digital badge credentials might have for those working in the sector, future entrants to the sector, and particularly for enterprises attracting and retaining employees in the sector. Two key programmes that had not previously held any formal award certification were identified to form part of the research study:

- Food Processing Engineering Principles
- Speciality/Artisan Food Marketing – A Focus on Digital Marketing

Digital badges were then successfully secured for these programmes. These were the first digital badge credentials awarded by the Food Industry Training Unit at University College Cork. In total, 53 individual employees from 47 companies undertook these programmes as part of the study.



Speciality/Artisan Food Marketing –  
A Focus on Digital Marketing



Food Processing Engineering Principles

### What Is a digital badge?

A digital badge or micro-credential is an image, icon or indicator of an accomplishment that can be verified online. They can be awarded for short courses that meet certain verified criteria. Unlike a certificate of attendance, digital badges offer tangible and practical awards for employees continuing to develop their skills. They also offer enterprises a unique way of:

- Upskilling their workforce;
- Assessing potential employees; and
- Monitoring internal employee development.

In considering the potential value of digital badge credentials, the research has taken into account feedback from individual employees completing the two programmes now holding a digital badge credential, and feedback from the perspective of food and agri-food enterprises and employers.

### Key research findings

The characteristics that define digital badges today make them well suited to supporting individualised pathways for learning, reflecting trends in adult education, as digital badges provide an opportunity to recognise those who are outside the formal education system. The competencies and skills earned via digital badges which are focused in nature are useful to the employee and can provide tangible evidence of skills for a potential employer. Digital badges are a future technology that supports alternate learning pathways. They enhance traditional learning systems by allowing employees develop skills and competencies in areas that may not have been covered to a desired level during a primary degree or other formal qualification.

The research indicates that we are facing a new dawn in identifying and recognising innovative and advancing learning technologies for the food and agri-food sector in Ireland. Digital badges herald a new chapter in supporting Ireland's skills agenda. Digital badge technology offers opportunities to both vertically and horizontally link and stack learning and skills achievements earned in the workplace. This in turn empowers and motivates employees to develop focused, relevant and timely cutting-edge skills and competencies. This also offers employers the opportunity to upskill their employees through increased innovative lifelong learning which enhance and support our future world of work.

The food and agri-food sector in Ireland represent a highly dynamic industry which competes with other science and manufacturing driven sectors. It therefore must remain responsive to changes in key global processes, technologies and manufacturing techniques. As part of this research study, many companies within the sector have demonstrated a willingness to embrace new learning methods and adapt to new learning technologies.

One barrier associated with the adoption of digital badge usage within an enterprise context is ensuring standards and quality assurance systems are credible and authentic. This presents a challenge for Ireland in developing a formal digital badge ecosystem. To support this an increased demand for digital badges would also be required. From an Irish perspective, this report finds that there is evidence that digital badge credentials are increasing and have an applicability within workforce development.

The **Taste 4 Success Skillnet** works with its members to identify and drive training and upskilling in the food, seafood and drink sectors, to meet business, people and performance needs.

The **Food Industry Training Unit**, University College Cork, services the part-time CPD and training needs of people working in, or associated with, the food and related industry sectors.

# INTRODUCTION

In 2018, Taste 4 Success Skillnet, a member of Skillnet Ireland, identified a potential opportunity to further develop, enhance and recognise the learning and upskilling of employees working and operating in its member companies in the food and agri-food sector. Digital badge credentials have been a recent developing phenomenon in industry and academia, particularly in the United States and in parts of Australasia but are still a new concept in Europe.

### Industry-led learning and upskilling

Taste 4 Success Skillnet secured approval from Skillnet Ireland to commission a review of the current educational and learning systems in Ireland in respect of digital badge credentials and its applicability within the food and agri-food sectors. This research took into account the concept of and the opportunity for recognising micro units of learning and awarding appropriate digital credentials for industry-led learning and upskilling.

### Quantum leap in recognition of learning and development

Digital badge credentials present a quantum leap in capturing and awarding value to learning and knowledge gathered in the workplace. This is still a relatively new international learning technology. The research contained in this report considers in detail the value of digital badge credentials, and the opportunity for further development of these, for the Irish food and agri-food sector.

### Key food and agri-food programmes identified

Two key programmes, which had not previously held any formal award certification, were identified to form part of the research study. These programmes were previously designed in collaboration with Taste 4 Success Skillnet member companies and in conjunction with the Food Industry Training Unit (FITU) at University College Cork (UCC).

These programmes had to be reviewed and agreed by the Digital Badge Sub-Committee at UCC to ensure they:

- Had the substance and potential to attract digital badge credentials; and
- Were current, relevant and in demand across the food and agri-food sector.

To encapsulate a wider view of the potential impact and opportunity for digital badge credentials, the two programmes identified covered two key primary categories of workers operating in the food and agri-food sector:

- Those working in food processing/engineering roles; and
- Those operating in speciality foods or in an artisan/micro capacity.

### Food processing engineering principles

This was the first programme identified as appropriate to go through the digital badge application process. The programme is targeted towards the following agri-food sector employees:

- Technical, quality and marketing managers
- Production staff and plant operators
- Quality assurance personnel
- Product developers and R&D personnel
- Food retailers

The programme runs over 2 days and consists of 20 hours of learning. The Food Processing Engineering Principles workshop is presented by experts with vast experience in the application of engineering tools to solve relevant problems in the food industry. The Food Processing Engineering Principles badge is then awarded to those who have attended and successfully completed the workshop. The engineering principles covered in the programme include topics such as fluid characteristics, concentration processes and powder handling. They can be applied to troubleshoot a broad range of commercial food products and ingredients.

Earners of this badge achieve the following:

- Improved confidence dealing with engineering problems and calculations and in performing heat and mass balances on processes.
- Learn about the effects of heat on microbial inactivation, enzymes and chemical reactions, with reference to D and z values and process evaluation for  $p^*$ ,  $F_0$ ,  $B^*$  and  $C^*$  values.
- Improved understanding of the principles of concentration, fractionation and drying processes.
- Can incorporate concepts from rheology to support efforts at process analysis.
- Are updated on the latest science in powder flowability and dissolution.
- Provided with information on useful engineering concepts, including streamline and turbulent flow, fouling, residence times and distributions, steam properties and energy conservation.
- Given an expert overview of safety and quality issues, units and dimensions and methods of measurement.
- Increased awareness of the latest advances and future possibilities in engineering-based approaches to food processing design.

### Speciality/artisan food marketing – A focus on digital marketing

This was the second programme identified as appropriate to undergo the digital badge application process. The programme is particularly targeted towards micro/SMEs, as follows:

- Those who are considering setting up their own speciality food business.
- Those who have already set up a speciality food business and would like to learn more about how to use digital marketing for their product.
- Those who are responsible for the marketing of products within the speciality food sector.
- Those who need to upskill to learn more about marketing their product or service.

The programme runs over 1.5 days and consists of 20 learning hours. The workshop focuses on introducing participants to key marketing terms, with a specific emphasis on digital marketing. It covers the marketing environment, the marketing mix, the segmentation targeting and positioning strategy, and increasing brand awareness. At the end of the course earners of the badge will:

- Have a greater awareness of digital media and how it impacts their business;
- Understand how to identify their target market and the factors that impact upon that market; and
- Be capable of communicating the unique selling point (USP) of their product to increase customer value and the likelihood of repeat purchase.

### Research report overview

This research report is broken into five key sections.

- Section 1 Provides an overview and context for the research study.
- Section 2 Contains a context and background to digital badge credentials and technology and considers how digital badges are used and perceived by students and enterprises in areas where they have become popular.
- Section 3 Presents the research methodology used.
- Section 4 Presents the findings of the research.
- Section 5 Presents the recommendations and conclusions of the research, considering the potential for digital badge credentials across the Irish food and agri-food sector.

A person wearing a white lab coat, a white surgical mask, and a white hairnet is working in a laboratory. They are wearing black gloves and are focused on a task. The background is blurred, showing other people in lab coats. The entire image has a green overlay. A white bracket is on the left side of the text.

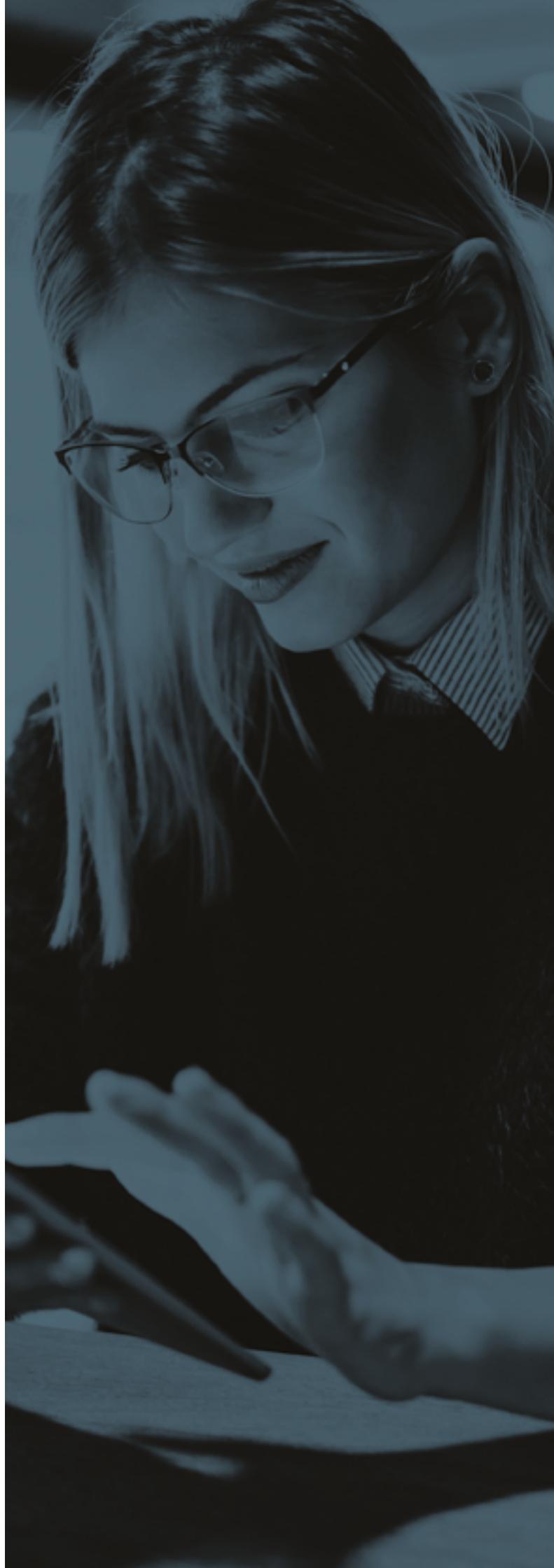
Identify and explore  
the opportunities to develop  
digital badge credentials for  
non-accredited programmes.

# Section

# 1

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Overview of the  
Research Study



### 1.1 Research aim and objectives

The aim of the research study was to identify and explore the opportunity to develop digital badge credentials for non-accredited programmes undertaken by member companies and employees in the food and agri-food sector.

The objectives of the research were:

- What potential value could digital badges have for employees working in the food and agri-food sector in Ireland?
- What potential value could digital badges have for enterprises within the food and agri-food sector in Ireland?

### 1.2 Research context

As attitudes towards technology change, so too does the need to use it. There has been continued talk about how the structure of education is changing, not just in Ireland but across Europe and the rest of the world. Barber et al. (2013) wrote about the ‘revolution’ which higher education faced and urged a radical change to the current system, one which embraced technology and gave people opportunities for CPD. The European Commission addressed the topic in a proposal focused on ‘A common framework for the provision of better services for skills and qualifications’ where it acknowledged new forms of education, specifically mentioning ‘digital open badges’ (p13, European Commission, 2016).

In 2017, it was estimated that 89% of the Irish population were ‘online’ and ‘connected’ (CSOa, 2018). An increasing number of people (16%) were completing an online course or going online to engage with learning material and improve/develop new skills (CSOb, 2018). In Ireland, traditional qualifications are typically associated with courses that require physical attendance on a part- or full-time basis. These vary in type from certificates right through to diploma and doctoral-level accreditations (Figure 1). These offer learners an opportunity to complete a course over a specific period, and upon successful completion award the learner with an overall qualification.

However, this traditional system represents just one pathway of learning, one which may not be favourable to those in full- or part-time employment. There is a rise in the number of people completing short courses and massive open online courses (MOOCs) in Ireland (Morgan McKinley, 2017). Employees who are time-poor may prefer to complete tailored shorter courses focused on the development of very specific skills and knowledge. These would minimise the amount of time they spend in education while maximising their potential in the workforce. However, in Ireland such courses are not usually part of the traditional accreditation system (a physical qualification in the form of a certificate, diploma, etc.).



Figure 1: Irish National Framework of Qualifications (NFQ, 2019)

### International models of digital badge credential recognition

The New Zealand Qualifications Association (NZQA), equivalent to Quality and Qualifications, Ireland (QQI), outlined the need to focus on alternate pathways for learning. In August 2018, the NZQA announced it would be incorporating micro-credentials into the official New Zealand learning and training framework. The New Zealand Qualifications Framework states:

‘Qualifications can be achieved in different settings including the workplace and education institutions..... Having programmes of study and industry training that lead to a qualification allow learners to achieve it in ways most suited to their educational, work or cultural needs and aspirations. This may include credentialing learning obtained formally or informally towards the qualification’(NZQA, 2018).

In this new system, micro-credentials (digital badges, nano-degrees and nano-credentials) are recognised as official stand-alone qualifications and are awarded a credit weighting. The credits range from 5 to 40 credits positioning them as a step towards (5–35 credits) a certificate or at the same level as a certificate qualification (40 credits) in the current system (NZQA, 2018). The New Zealand Minister for Education Chris Hipkins indicated that the inclusion of micro-credentials in the traditional New Zealand qualifications framework was necessary to support employees and industry. In a press release on the matter he stated that:

**‘Micro-credentials will provide industry with an opportunity to work with Tertiary Education providers and Industry Training Organisations to bring training related to new or in-demand jobs to market quickly. That’s good for employers to access the skills they need, and for providers to ensure they can respond to local demand.’**

Hipkins, 2018

”



Digital badges are  
strategically important  
for the future.

# Section

# 2

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Background to  
Digital Badges



### 2.1 What is a digital badge?

The concept of digital badges as a recognition for competencies and skills was started by the MacArthur Foundation and driven by the Mozilla Foundation in 2011 to recognise the high levels of individual and social learning taking place (Mathur et al., 2018). Since then, interest in digital badges has been growing across academic and certain industry sectors. A digital badge is an image, icon or indicator of an accomplishment, competency, learning, disposition or skill. It can be displayed, accessed and verified online (Accredible, 2018; Ellis et al., 2016) (Figure 2). Digital badges are a type of digital credential and fall under the umbrella term 'micro-credentials'. Micro-credentials are digital credentials. They encompass digital badges, web badges, nano-degrees, mini-degrees and micro-certifications (Kuriacose and Warn, 2017).



Figure 2: Digital badges developed for the study (UCC, 2018)

Unlike traditional forms of recognition like a college degree or transcript, a digital badge does not display a list of courses completed to achieve one overall qualification. Instead, a digital badge displays specific learning and skills acquired during a single course (La Magna, 2017).

Digital badges can be earned across a variety of different environments and topics but to date have been most popular in the academic and the information technology (IT) sectors. In an academic setting they are offered for short courses that would otherwise go without accreditation.

The National Forum for the Enhancement of Teaching and Learning has been a key driver of digital badges within the education system in Ireland. It has developed a specific digital badge system for the Irish higher education system (Donnelly, 2018). Within industry, they are awarded to demonstrate proficiency in learning in a particular area or development of a new skill. Outside of this they are utilised to recognise development in extra-curricular activities or volunteering.

### 2.2 How are courses approved for a digital badge?

Although there are many non-accredited courses in the higher education system, not all are suitable for digital badge approval. Although approval criteria will differ from institution to institution, all courses must be reviewed for suitability. In the case of UCC, an application outlining the details of the course is completed and reviewed by the university's Digital Badge Sub-Committee (DBSC), which includes academic staff representing the different schools in UCC. The application must clearly show the learning outcomes (badge criteria) of the course. It must provide an adequate assessment, ensuring there is evidence that trainees have developed new knowledge or learnt new skills in line with the proposed learning outcomes. This process ensures that digital badges are in line with the needs of industry and meet the standards set by the university in terms of academic content.

### 2.3 Digital badge structure and type

There are two broad category of badges – internal badges and open badges. An **internal badge** is one which is only used and recognised within a particular module, programme or club (All Aboard, 2017). An **open badge** is one which belongs to a common system, for example Mozilla Open Badges. It allows for standardised issuing, collecting and displaying of digital badges across different platforms, verified through credible organisations. Badges that belong to the open system must contain background information about how the badge was earned, when it was earned and who issued it. This information is stored as meta-data. The visual representation of a digital badge can differ from provider to provider. However, they always contain the logo, the credible provider, the year of award, and the event or award title (as indicated in Figure 3).



Figure 3: Illustration of open badges – UCC/UCD comparison (UCC, 2018; UCD, 2018)

The UCC digital badge is in the form of the UCC crest, and it gives space for two logos in the top section. This allows UCC to work with external groups and include specific industry logos on the digital badge qualifications where necessary.

Other core components of a badge include the information needed to determine its validity, authenticity, source and value. This includes (Finkelstein, 2013) the:

- Name of the person earning the badge;
- Organisation responsible for issuing the badge;
- Criteria and description of the course or workshop taken;
- Evidence documenting the work performed;
- Date the badge was awarded; and
- Expiration date (in some cases).

The badges provided through Mozilla Open Badges are not proprietary and use free software and an open technical standard (Schwarz, 2016). This means any organisation has the ability to create badges. The Mozilla system also supports those who collect a number of badges, allowing badges to be stored in a single online location referred to as the person’s ‘backpack’. From the backpack, it is possible to share badges to a variety of platforms, such as LinkedIn (Backpack, 2018).

## 2.4 General perception towards digital badges

Although digital badges are still quite a new concept, digital credentials have been gaining increased attention over the past number of years. Fong et al. (2016) found that the overall attitude and perception towards alternative credentialing, including digital badges, was increasingly positive. In 2015, The New Media Consortium (NMC) Technology Outlook for Higher Education in both Ireland and Australia outlined digital badges as a key trend to be considered between 2015 and 2018 (NMC, 2015).

### 2.4.1 Quality and Qualifications Ireland (QQI)

As part of this research study, a review of the Irish National Qualifications Framework found that it currently does not consider digital badges. However, a recent report commissioned by QQI, and carried out by independent expert Mike Coles, highlighted the significance of micro-credentials. The report, *National Qualifications Frameworks – Reflections and Trajectories*, made particular reference to digital badges. It highlighted the need to recognise and certify learning from less traditional pathways. It also suggested the possibility of a system in which all aspects of a person’s learning could be electronically documented or confirmed (Coles, 2017).

### 2.4.2 Earner perceptions towards digital badges

Although still a relatively new concept, digital badges are becoming more common in the Irish third level sector. A desk-based review of the registered universities and colleges in Ireland carried out for this study showed that close to 30% of third level institutions are currently offering digital badges of some kind. These digital badges vary considerably between institutions, but a large proportion have developed through a university or national project. In addition, initiatives have

stemmed from collaboration in projects supported by the Higher Education Authority (HEA) under The National Forum for the Enhancement of Teaching and Learning in Higher Education (Teaching and Learning, 2017). These projects were particularly prevalent during 2016 and 2017 and created development structures and systems to support the development of digital badges on a long-term basis. Table 1 provides examples of some of the badges developed during these projects.

Title	Badge providers	Description
Teaching Strategies for (New) Lecturers	Cork Institute of Technology (CIT)	This course consists of 25 learner effort hours. The assessment includes 4 assignments linked to 4 specific learning outcomes.
Reflective Practice in Teaching	Letterkenny Institute of Technology (LYIT)	This course consists of 25 learner effort hours. The assessment consists of the creation of an e-portfolio documenting reflections and engagement.
Digital Policy Development in Teaching and Learning	National Forum for the Enhancement of Teaching and Learning in Higher Education	This course consists of 25 learner effort hours. The assessment includes 6 tasks which relate to the 6 topics covered during the course.

Table 1: Example of digital badge courses (National Forum for Teaching and Learning, 2018)

Earners place significant value in having some form of formal recognition for their participation in non-accredited courses, and digital badges are a positive way of illustrating their achievements to potential employers (Dyjur and Lindstrom,

2017; Glover, 2016). The Head of Digital Education in UCC, Tom O'Mara, stressed that it is important for higher education institutions to recognised alternate pathways beyond simple attendance and completion.

**'UCC's use of digital badges reflects a need to recognise skills and knowledge gained by students outside of formal accredited learning within UCC – it's important for us as a traditional larger higher education institute to recognise that independent thinking is often fostered outside of credit-bearing modules and these learning opportunities are very valuable to people working full-time. Badging allows us to recognise effort and learning beyond simple attendance and completion, and doing it online is simply a reflection of the digital presence and footprint we are all creating in our everyday lives, not just our work lives.'**

**Tom O'Mara, Head of Digital Education, UCC**



### 2.4.3 Industry perceptions of digital badges

Although new within industry in Ireland and many parts of Europe, in North America digital credentials have been gathering pace, and a number of studies have considered the topic of digital badges and micro-credentials (Market Research Future, 2019). Between 2016 and 2017, 25% third level institutions in North America offered badges to students, with 75% of these outlining such credentials as ‘strategically important’ for the future (ICEF Monitor, 2018).

A study carried out by Fong et al. in 2016 established that badges were strategically important as they allowed employees and employers to stand out in a highly competitive market.

Currently in North America multinationals in the technology sector, such as IBM, Microsoft and Adobe, are leading the way in promoting the use of digital badges within their workforce. A recent example of a digital badge developed by IBM is evident in Figure 4.

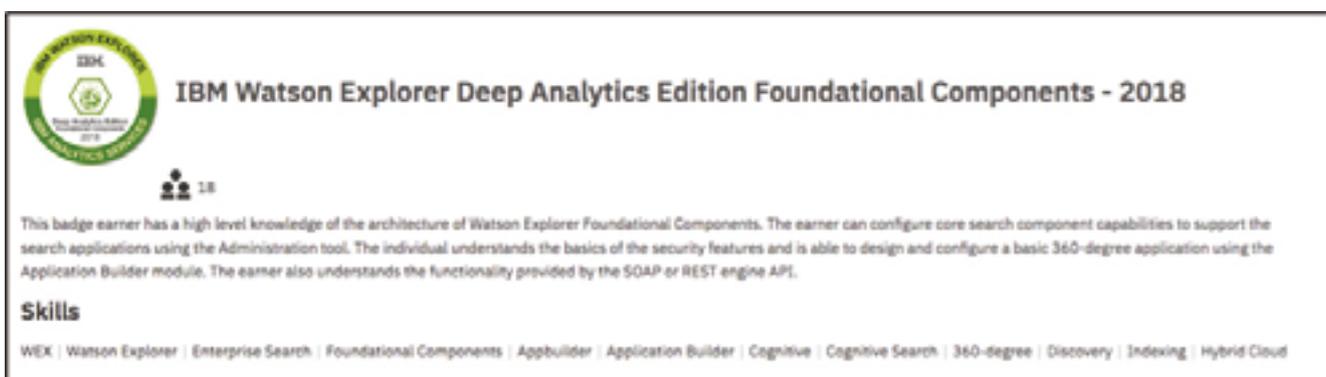


Figure 4: IBM digital badge example (IBM, 2018)

IBM was one of the first companies to partner with a university, North Western US, for its digital badge programme. It reached its one-millionth badge in July 2018 (IBM, 2018). Recently, increased interest from industry has seen more academic institutions begin to offer digital badges tailored to specific

industry needs. Fong et al. (2016) carried out research that asked institutions about their future strategic plans. The study showed that 34% of them had a strategic plan which included the provision of alternative credentials, including micro-credentials with industry.

**'An example where academic institutions and industry are working to gain a mutual benefit from digital badges is the case of the University of California, Davis, where traditional credits in a new undergraduate programme in sustainable agriculture and food systems are complemented by awarding digital badges for seven core competencies, each of which was designed together with potential employers.'**

Lowendahl, 2016

However, currently in North America the agriculture and food sector have the lowest offerings in terms of digital credentials and therefore offer significant opportunity for development (see Figure 5).

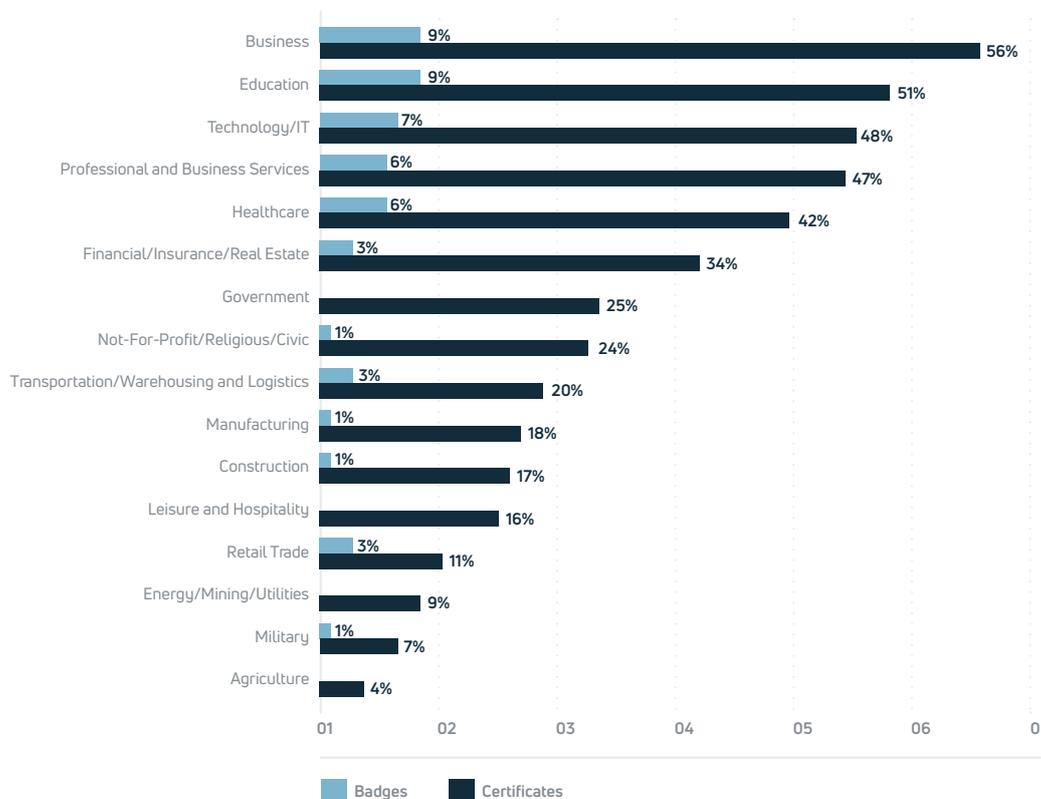


Figure 5: Industries for which US institutions offer digital badges (Fong et al., 2016)

A significant development for digital badges were developed in New Zealand in 2018 when micro-credentials were introduced into the traditional learning and training framework. Minister for Education Chris Hipkins stated that:

**Maintaining up-to-date skills will become an increasingly important way to improve and future-proof employability.**

**Hipkins, 2018**

”

The minister indicated that one of the driving forces behind using micro-credentials was a clear industry need for recognition of alternative credentials and lifelong learning opportunities for employees.

#### **2.4.4 Increasing scope and opportunity for digital badge credentials**

From an Irish perspective, there is evidence that digital badges are moving out of the realm of the university and into the wider education sector. This could be in part due to the significant funding that the education sector, through the National Forum for Teaching and Learning in Ireland, has contributed to research in this area (Teaching and Learning, 2017; All Aboard, 2016). However, there is significant potential for digital badges to be used in sectors other than education. Although the National Qualifications Framework does not yet include digital badges, based on a recent report it is evident that QQI recognises their importance as an alternate pathway to the accreditation of learning. In addition, the recent inclusion of micro-credentials into the New Zealand Qualifications Framework may provide a model from which an Irish framework could be considered.

#### **2.4.5 Impact of digital badge credentials on future programme design**

Within the framework of the open badge system, every badge goes through a review process to check its suitability. Although the review process may vary from institution to institution, each review considers the academic standards associated with the relevant provider, in this case UCC.

It is likely that as awareness of the availability of digital badges increases, the desire for learners to complete short courses without an award will decrease. Learners will seek out courses that provide a tangible reward that can be shared with their current or prospective employer. Those designing future programmes will have to ensure that short courses give clear learning outputs that are consistent with specific digital badge criteria.

Courses in UCC that have a digital badge must also include an element of assessment. The assessment is not limited to traditional assessment styles but offers a variety of assessment types, including but not limited to reflective logs, recordings, projects, presentations, and learning diaries. An assessment provides evidence that learning outputs have been achieved. It provides a key metric for course providers to use when improving or developing the course.

Furthermore, digital badge courses provided through UCC are time specific and must be updated after a period, e.g. 12 months. This means that courses must be updated on a regular basis to ensure they keep their digital badge credentials.

The background features a hand holding a pen pointing at a tablet screen. The screen displays a circular data visualization with several data points connected by lines. The overall color scheme is green and blue.

53 trainees  
2 courses  
43 different companies



# Section

# 3

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Research  
Methodology and  
Survey Results



### 3.1 Research design for this study

The purpose of this research study was to consider the potential value digital badges could have for enterprises and employees in the food and agri-food sector. This report draws on a body of information including desk-based research on the use and applicability of digital badge technology and micro-credentials within higher education and enterprise contexts today. It also includes a research study on the process of securing digital badge accreditation by UCC for two new programmes and the subsequent opinions of employers, trainees and other stakeholders that engaged in this process for the purpose of the study.

Digital badge technology is new in Ireland, particularly to enterprise and the learning and training environment. As part of the research study, the wider implications and potential impact on learners, both low, medium and high skilled, were looked at. Feedback on the potential impact was sought from QQI and from institutions nationally.

### 3.2 A practical application of digital badge technology

As digital badges for the food and agri-food sector were not yet available at the start of this research study, it was necessary for Taste 4 Success Skillnet and its partner FITU to identify learning programmes that could go through the digital badge application process. Taste 4 Success Skillnet provides funding to its members attending learning and upskilling programmes. So together with FITU it identified the two most appropriate programmes, as they covered two broad areas within the industry – process engineering and marketing. Each course had to be considered in light of the digital badge application and an assessment linked to the learning outcomes had to be developed with the course lecturer.

In total, **53 trainees** took part in **2 courses** during October and December 2018. These individual trainees represented **43 different companies** in the food and agri-food sector in Ireland.

The first course, **Food Processing Engineering Principles**, was attended by 27 trainees. The second course, **Speciality/Artisan Food Marketing – A Focus on Digital Marketing**, was attended by 26 trainees.

### 3.3. Outline of programmes and target groups

The study considered perceptions from two groups of people. The first were individual employees in the food and agri-food sector, who intended to take part in a short non-accredited citation 1 programme which had been awarded digital badge recognition (the trainees). Secondly, for enterprises the study considered the perceptions of those responsible for organising and promoting CPD in companies in the food and agri-food sector in Ireland.

This included HR managers and senior/top-level management. Perceptions from both groups were gathered between October and December 2018.

The first course to go through the digital badge application process was **Food Processing Engineering Principles**. This course was targeted towards the following employees:

- Technical, quality and marketing managers
- Production staff and plant operators
- Quality assurance personnel
- Product developers and R&D personnel
- Food retailers.

The course ran over 2 days and consisted of 20 hours of learning. The assessment required the completion of three questions based on the material discussed during the course. These questions considered different scenarios the trainees were likely to experience in their workplace. They required trainees to apply the new knowledge they had learnt and to practice the calculations discussed during the course. The answers were reviewed and saved as evidence that students had successfully completed the course.

The second course to go through digital badge approval was **Speciality/Artisan Food Marketing – A Focus on Digital Marketing**. This course targeted those considering setting up their own speciality food business, those who have already established a speciality food business and would like to gain an understanding or update themselves on how to go about marketing their product or service or those who were responsible for the marketing of products within the speciality food sector. This course ran over 1.5 days and consisted of 20 learning hours of learning. The assessment required students to produce a marketing plan that considering the topics discussed. The marketing plans were reviewed and saved as evidence that students had successfully completed the course.

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<sup>1</sup> Short non-accredited UCC course: a course which can run from 1 to 5 days and does not provide academic accreditation

The details of each student were then uploaded to an internal platform, managed by the Digital Badge Sub-Committee in UCC. This committee then develops a profile for each of the students on the Mozilla platform which includes the badge they successfully achieved. Students then receive an email with a link to access their badge.

### 3.4 Choosing the sample trainee groups and research method

Taste 4 Success Skillnet has worked with its member companies to identify, design and deliver a wide variety of technical programmes in food engineering and food science, in conjunction with FITU at UCC. These programmes are promoted widely through a number of direct and online channels.

- The first course, **Food Processing Engineering Principles**, was attended by 27 trainees.
- The second course, **Speciality/Artisan Food Marketing – A Focus on Digital Marketing**, was attended by 26 trainees.

#### 3.4.1 Feedback from trainees

A short digital questionnaire was used to gather information on the basic perceptions the trainees had of digital badges using the Slido application during the course, which allowed all trainees in the class to share their answers in real-time (Slido, 2018). The application presented each question individually on the classroom screen and requested trainees to provide an answer via their mobile device. The questions focused on establishing any prior knowledge of digital badges and potential for their use by the trainee.

#### 3.4.2 Feedback from enterprise

Market research feedback from the second group of participants, enterprises in the food and agri-food sector, was then gathered to provide a more general overview from a world of work perspective.

Ten companies were selected that represented a cross-section of the food and agri-food sector in Ireland. These companies were selected based on their history of supporting learning and development and CPD for employees over the previous 24 months. Key contacts were identified in the ten companies and an email was sent outlining the purpose of the research.

Individuals were asked to share their opinions and given the option to do so in person or by phone. All participants preferred a short phone conversation. The phone interviews were carried out between September and November 2018.

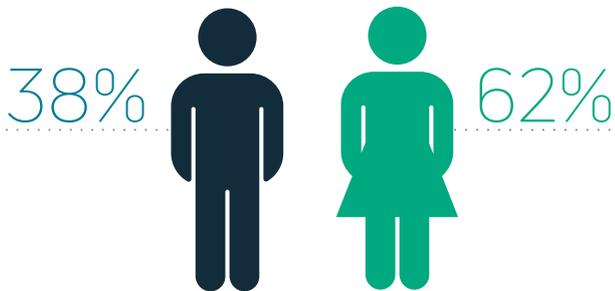
The information relating to the specific company and its representative is confidential. However, the comments shared by the company representatives are included below.

The research includes a cross-section of companies to ensure that all of the food, beverage and agri-food sector were targeted.

Feedback indicates that the development of new learning technologies to recognise skills and development, such as digital badges and micro-credentials, needs the support of a national 'working group'. This group would include member companies/enterprise representatives. It would address digital badge technology across a number of sectors encompassing HEIs, private providers, professional awarding bodies, QQI and Skillnet Ireland, as leaders in learning technology change.

### 3.5 Results – Trainee profile & perceptions

A slightly higher percentage of females enrolled in the two courses. However, no significant relationship between gender and company or gender and job-type were found.

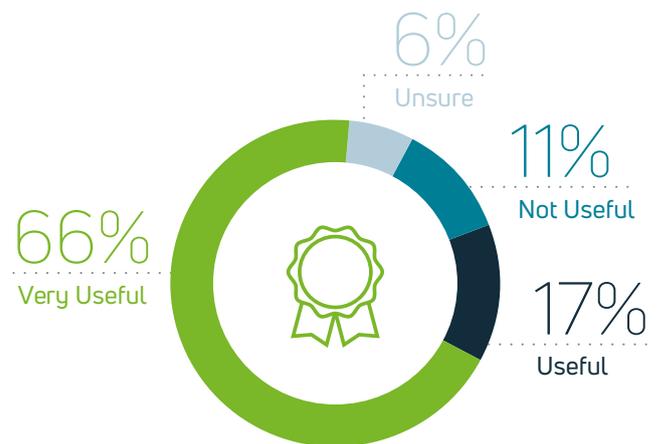
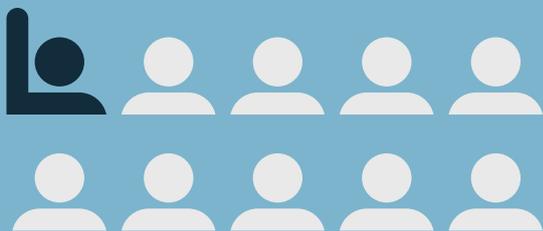


Almost all of the trainees indicated that HR managers should consider digital badges when an employee applied for a promotion in the company.



The majority of trainees also indicated that an interview panel should consider digital badges when an external candidate applies for a position in the company.

General awareness of digital badges was low (as expected). Just one in ten said they had heard of a digital badge before the course. 'Micro-credential' was not a term familiar to any trainees on either course. Trainees showed an interest in the topic, asking questions about how badges could be used and earned. Some trainees made the connection between digital badges and the badges received in sport/youth groups, such as the scouts.



Over 80% of trainees believed that earning a digital badge would be **useful or very useful** to them in the future.

The majority of trainees (85%) had an online profile, e.g. LinkedIn.



Almost all of these trainees (96%) indicated they would be happy to display a digital badge on their online profiles.



The idea of something tangible was attractive to the trainees. A certificate of attendance was mentioned as useful, but it was also acknowledged that such certificates 'hold little weight' and get lost over time or are never used. The digital nature of the badge was mentioned as potentially more convenient to trainees.

I think it is a good idea to get something you can take away with you.

- Credible
- Easy to access
- Innovative
- Modern
- Technology
- Recognition

Trainees were then asked to share a word or phrase they thought best reflected digital badges. Six words were most frequently mentioned and represented 66% of the group...

### 3.6 Results – Employer perceptions

The study included four categories of management in companies/businesses from the following sectors:

- Dairy
- Meat and fish
- Processed food
- Beverage
- Food and feed

Category	Percentage
Owner/CEO	20%
HR manager	40%
Training/development manager	10%
Other senior management	30%

Table 2: Category of food and agri-food employers involved in the study

Of the ten companies that took part in this research study, **two had heard of digital badges previously**. One person indicated that although they had heard of digital badges, they had not been given any guidance about their specific use by their IT department, and so were unsure about their importance. The second person advised they had heard about digital badges being used in the IT sector but did not realise they were now relevant in the food sector.

All participants received an email with a short summary on what the research was about and a brief explanation of digital badges. The majority of enterprises (80%) asked for further information on digital badges and how they could be used. **The majority of enterprises (70%) were positive about the concept of digital badges.** Some 40% of participants made a positive comment about their relevance in keeping up to date with technology.



**'I think this is very positive. It is necessary to move towards such an award given the move to digital.'**

**Senior management, meat and fish sector**

Each participant was asked how digital badges could be relevant to their company. Some 30% believed that digital badges would benefit the business positively. One owner believed that a digital badge could empower staff and found this to be very positive.



**'I heard about them in the IT sector only. It would be interesting to see how they could be used.'**

**Senior management, meat and fish sector**



**'I would support this as it would empower staff and it is important to support staff in their development.'**

**Owner/CEO, meat and fish sector**

A HR manager in the dairy sector specified that digital badges could be very helpful for the development of soft skills. Another HR manager believed that they would be helpful when doing employee appraisals or when an employee applied for a promotion.

The remaining 70% of participants found it **difficult to assess, at this time, how a digital badge could be of benefit to the business.** The majority indicated that without any previous knowledge or experience of the badges, it was a difficult question to answer.

One owner/CEO in the processed food sector advised that they were uncertain how a digital badge could be of value to their business as they were a small team. However, the participant advised that if the company was to support CPD and had a choice between a course with a digital badge award and a course without one, they would select the course with the digital badge, as it provided something tangible for their employees.

The phone conversations allowed managers to ask questions about the topic. A senior manager said they believed digital badges would have significant relevance to industry if they were also awarded for distance learning or online courses. A total of **60%** of the participants advised that the type of information made available on the badge would be important. **Some 90% advised that the provider of the badge, for example UCC, would be important.**



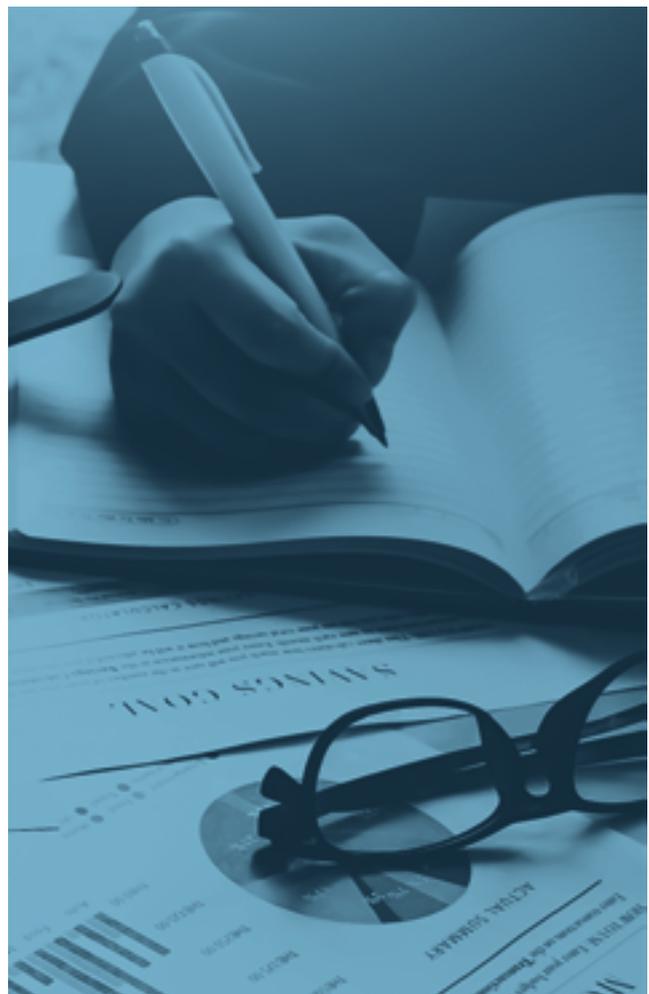
**'What would be interesting and I think more relevant to industry is if digital badges were awarded for distance courses.'**

**Senior manager, beverage sector**



**'... all things being equal, the presence of a digital badge would be a motivating factor in choosing a course to support CPD for my employees.'**

**Owner/CEO, processed food sector**





Digital badges can help document continued professional development.

# Section

# 4

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## Conclusions and Recommendations



#### 4.1 Potential for digital badge awards

This research study has considered digital badge credentials from two perspectives. The first was from the perspective of industry management within the food and agri-food sector. The second was from the perspective of employees who completed a short previously non-accredited course, which was subsequently awarded a digital badge credential.

Overall, it was clear there is currently a low knowledge base around the topic of digital badges, both at a general enterprise level and at an individual employee level. Although general awareness of digital badges was low, employers indicated that it was something they would be interested in supporting. The feedback showed that there is still a lack of understanding of the full value or meaning of digital badge accreditation yet a strong willingness to explore this further and a clear agreement in the need to recognise the skills and competencies of employees. Employees indicated that digital badges would be of value to them if they were recognised by their enterprises when applying for promotion or when sitting an interview.

This study was a successful partnership of enterprise and the Food Industry Training Unit in UCC. Since this study was completed, UCC have reported that the applications for digital badges across the entire university have increased significantly. The vice-president for learning and teaching in UCC, Prof Paul McSweeney, believes that digital badges will motivate employees in the food and agri-food sector to attain **'cutting-edge skills'**. Ms Mary McCarthy-Buckley, manager of the Food Industry Training Unit, also believes that digital badges offer significant potential **'in a fast-moving workplace'**.



**'We anticipate that UCC's digital badges will be of great value, empowering staff of the Irish food industry by documenting their continuing professional development and motivating them to attain cutting-edge skills.'**

**Professor Paul McSweeney,  
Vice-President for learning and teaching, UCC**



**'In a fast-moving workplace, digital badges are a convenient way for full-time employees to gain a micro-credential and have proof of upskilling after attending a course thus facilitating promotion prospects.'**

**Ms Mary McCarthy-Buckley,  
Manager, Food Industry Training Unit, UCC**

## 4.2 Value of digital badge credentials to employees

### 4.2.1 Supporting alternate learning pathways – the new world of work and learning

The characteristics of digital badges make them suitable for supporting individualised pathways for learning, in line with trends in adult education, as they provide an opportunity to recognise individuals who are outside the formal education system (Schwarz, 2016; Finkelstein, 2013). For those who have excelled in their jobs through life experience and on-the-job training, digital badges provide a way to capture and validate such knowledge and skills and to communicate them with a relevant audience.

Also, digital badges can help people making a career change. Although traditional qualifications may not be as relevant for a new career path, competencies and skills earned via digital badges, which are focused in nature, could be more useful to the employee. They would provide tangible evidence of skills to a potential employer.

### 4.2.2 Providing a stepping stone into third level education

The digital badge system does not have high barriers to entry and as such is open to all those interested in a specific topic. Such a system allows those who have not been in third level education to experience an academic environment in a more informal and less intimidating manner. It can act as a stepping stone for individuals who wish to progress to a more traditional qualification, such as an accredited module, certificate, diploma, etc.

### 4.2.3 Supporting traditional learning pathways

As well as supporting alternate learning pathways, digital badges can also enhance traditional learning systems by allowing employees to improve their skills and competencies in areas that may not have been covered to a desired level during a primary degree or other formal qualification. Such an approach could allow for focused CPD more suitable to the needs of employees, rather than courses that contain only some modules of relevance to employees.

### 4.2.4 Empowering employees

The All Aboard Programme, funded by Ireland's National Forum for the Enhancement of Teaching and Learning, identified that providing access to valuable skills using micro-credentials will help empower individuals (All Aboard, 2017). In particular, it would be possible for employees to gather a number of badges and 'stack' them to show career credentials and competencies.

## 4.3 Value of digital badge credentials to employers

### 4.3.1 Increasing employer participation in lifelong learning

A recent QQI report outlined that digital badges do not involve the same extent of administration associated with more traditional academic qualifications. They can also be cheaper to set up and easier to access for learners. Therefore, upskilling employees through the digital badges could help companies to overcome the significant cost barrier often used as an argument against upskilling staff - particularly in sectors where there is a low level of participation in facilitating workforce development.

### 4.3.2 Staff retention and responsive to staff needs

Providing employees with an opportunity to access and engage with their achievements on a real-time basis was the key to empowering and motivating them in the workplace. There is a variety of research supporting the link between empowered employees and their likelihood to remain in a company. Digital badges can play a role in providing enterprises with an opportunity to listen to and respond to any specific needs or skill gaps brought up by employees. Due to the short nature of courses supported by digital badges, enterprises can partner with a provider to develop a course based on the specific needs of their staff.

### 4.3.3 Identifying potential new candidates

A well-designed digital badge could represent many of the requirements of a job profile and so be a more meaningful reflection of a potential employees' capabilities. Therefore, it could be helpful to target HR managers and those responsible for training, learning and development to see how digital badges could be used in the interview and promotion system. HR teams are faced with the difficult and time-consuming task of reviewing applications to identify those most suitable for job vacancies. The availability of digital badges could help identify potential employees prior to the interview stage. This would reduce the time spent interviewing candidates who do not meet the exact requirements.

### 4.3.4 Impact of digital badge credentials on future programme design

It is likely that as awareness of the availability of digital badges increases, the desire for learners to complete short courses without an award will decrease. Learners will seek out courses that provide a tangible reward that can be shared with their current or prospective employer. Those designing future programmes will have to ensure that short courses give clear learning outputs that are consistent with specific digital badge criteria with appropriate delivery and assessment methods. Badges can also be stacked or linked. **Stacked badges** could represent courses that focus on the same topic but at varying degrees of detail. **Linked badges** allow enterprises to focus on different topics, receive separate badges for each but acknowledge that there is overlap between the topics. Such a system could help enterprises to offer CPD progression to their employees.

### 4.3.5 Provision of skills to facilitate urgent industry needs

In a recent article written by technology company IBM, the company indicated that the current education system was unable to provide graduates needed for the jobs they had available (Leaser and Akers, 2018). As specific sectors within the food and agri-food sector will develop at different speeds, it is likely that gaps in knowledge will be identified. Digital badges could be used in this context to address urgent skill gaps in the sector, giving industry a means of providing employees with the exact skills required.

### 4.3.6 Building strategic relationships

Digital badges can act as a means of bringing together non-traditional partners and stakeholders. Finkelstein (2013) stressed the important role the 'issuer', in this case UCC, had in the context of digital badges and the role they play in the development of them. A digital badge must be in keeping with the academic rigour and ethos of the university. Collaboration between learning providers and industry is not a new concept and within UCC the Food Industry Training Unit focuses specifically on providing for the needs of those within the food industry. This could have application across a range of academic institutions, sectors and companies.

### 4.3.7 Co-branding opportunities

Digital badges also offer a unique opportunity from a branding perspective. Currently, the digital badge structure allows for the allocation of two logos within the badge. One logo typically represents the skill or specific department within the university. The second logo may belong to an external industry stakeholder who has been involved in the course or has sent employees on the course. The collaboration and co-branding are mutually beneficial for both parties. Enterprises become associated with the academic rigour synonymous with a university, while the university maintains important connections with industry, ensuring that it remains responsive to the ever-changing needs of the food and agri-food sector.

## 4.4 Considerations for the future

### 4.4.1 Increasing scope and opportunity for digital badge credentials

From an Irish perspective, there is evidence that digital badges are moving out of the realm of the university and into the wider education sector. There is significant potential for digital badges to be used in sectors other than education. Although the National Qualifications Framework does not recognise digital badges, based on a recent report it is evident that QQI is aware of their importance as an alternate pathway to educational progression. In addition, the recent inclusion of micro-credentials into the New Zealand Qualifications Framework may provide a model from which an Irish framework could be considered.

### 4.4.2 Developing standards for micro credentials and digital badge recognition

The use of digital badges is made possible by recent developments in technology. One barrier associated with digital badge usage is ensuring they adhere to an agreed set of standards and appear as credible to potential employers as paper credentials (Glover, 2013). The open badge system ensures that badges are credible and authentic. However, it is necessary to have the right technology and a committee in place to ensure that standards and assessments are maintained. Therefore, staff would have to be assigned to these areas and trained to ensure the success of the digital badge ecosystem. To support such staff, an increased demand for digital badges would also be required.

#### 4.4.3 Future standards and partnerships – quality assurance

Taste 4 Success Skillnet and its member companies have developed an excellent reputation in supporting, designing and developing new leading-edge learning and upskilling for the food and agri-food sector in Ireland. As courses require updates and digital badges are adapted to suit the evolving needs of industry, it will be necessary to amend existing digital badge applications or submit new ones to relevant institutions. The Digital Badge Sub-Committee in UCC is tasked with ensuring that all badges adhere to the academic rigour associated with the university. Therefore, it will be essential to maintain a continued partnership and open communication channels between UCC and Taste 4 Success Skillnet to:

- Maintain current digital badges;
- Initiate digital badges for future learning and development programmes;
- Approve digital badges for future learning and development programmes; and
- Conduct an annual assessment on the value and quality of these credentials to enterprise and learners.

Further research should consider how many of the participants used their digital badges and in what capacity. Such information would be helpful in determining the value employees placed on a digital badge and how they felt they were of benefit to them. It may also be helpful in determining if there were any differences between certain sectors within the food and beverage industry. Also, it would be relevant to follow up with senior level management in the ten companies who shared their opinions. This would show if the opinions of senior management that had increased exposure to and experience of digital badges had changed.

#### 4.4.4 Communicating leading-edge learning technologies to industry

An important next step in supporting the food and agri-food sector in Ireland is increasing awareness about how digital badges can be used at an organisation level and mapping out a clear pathway for their use, both by employees and industry, would ensure that the Irish food and agri-food sector is maximising its potential to access skills and talents developed from less traditional education pathways. An important next step in supporting the food and agri-food sector in Ireland is communicating to and educating industry on the following:

- Changes in learning technologies;
- Advancement of digital badge credentials;
- Potential use of digital badges; and
- Value of digital badges.

Increasing awareness about how digital badges can be used at an organisation level and mapping out a clear pathway for their use, both by employees and industry, would ensure that the Irish food and agri-food sector is maximising its potential to access skills and talents developed from less traditional education pathways. National activities to support such an initiative have already taken place in the primary and post primary education sector in Ireland through a variety of national conferences and training seminars.

Similar activities aimed at the needs of the Irish food and agri-food sector would allow better awareness of the digital badges. These activities would provide an opportunity for interested enterprises to meet with experts and other interested companies (to form a ‘working group’) to explore in more detail how digital badge credentials could be used to create increased value for employees and Irish enterprises.



**'Increasing awareness about how digital badges can be used at an organisational level and mapping out a clear pathway for their use, both by employees and industry, would ensure that the Irish food and agri-food sector is maximising its potential to access skills and talents developed from less traditional education pathways.'**

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### About Taste 4 Success Skillnet

Taste 4 Success Skillnet is an enterprise-led learning network for companies of all sizes in the food and drink sector. Member companies work collaboratively to share best practice and to respond effectively to the specific skills needs of the sector. The network addresses both technical and non-technical skills needs of the sector. The objective of this national network is to maintain Ireland's position as a leading location for food and drink production by developing the skills base and supporting enterprise growth and competitiveness through highly specialised training. The network supports multinationals, large, medium, and small indigenous food production and service companies, and a growing number of Irish micro and artisan producers.

[taste4success.ie](http://taste4success.ie)



### About Food Industry Training Unit (FITU)

The Food Industry Training Unit (FITU) was established by the Faculty of Food Science and Technology, University College Cork (UCC), 25 years ago. This was in recognition of the importance of continuing professional development (CPD) to the food and related sectors. The FITU services the part-time training, continuing education and professional development needs of people working within the food, agri-food and seafood sectors. To ensure that FITU meets the dynamic and evolving needs of those working within these sectors, courses are developed in partnership with industry and relevant state agencies and UCC.

[www.ucc.ie/en/fitu](http://www.ucc.ie/en/fitu)



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