



# Griffith College

## Rapid MMC up/re-skilling of the construction workforce: a collaborative approach through the use of micro-credentials

By

Suzanne Burdis

Dissertation by practice submitted in partial fulfilment of the requirements for MA in Education and Learning Development (QQI)

Faculty of Teaching and Learning

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Declaration Page

*I hereby certify that this material, which I now submit for assessment on the programme of study leading to the award of the MA in Education Learning and Development, is my own; based on my personal study and/or research, and that I have acknowledged all material and sources used in its preparation. I also certify that I have not copied in part or whole or otherwise plagiarised the work of anyone else, including other learners.*

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## **Abstract**

This report provides background and insights into micro-credentials as an emerging education innovation and a possible solution to the rapid up/ re-skilling needs of industry, and the promotion of life-long learning among the adult population in Ireland.

Advancing technologies and green transitioning, among others, are changing jobs and increasing demand for technical, green, digital, and transferable skills among employees now and into the future. Ireland is below the EU average for adult participation in lifelong learning, with cost, inflexible delivery modes and ease of access cited as reasons. Education providers are challenged to respond to learner and industry needs as they too face disruptions, including talent drain and increasing costs. Micro-credentials are emerging as a possible solution, with significant government supports.

Ireland's population is predicted to increase significantly over the next 25-30 years, increasing demand for housing, buildings, industrial facilities, data centres, hospitals, schools, infrastructure projects etc. This demand cannot be fulfilled by the current Irish construction industry capacity. Modern Methods of Construction (MMC) is an innovation in construction and a possible solution, supported by government, but there is limited uptake of MMC in the sector due to the lack of skills and knowledge

In 2023, a successful collaboration between a private education provider and a construction industry representative, resulted in a micro-credential programme of education in MMC. In researching for the programme, the author applied an interpretivist research philosophy, inductive approach, and qualitative methodology including focus groups, interviews and surveys. The final approved programme, a 10ECTS, one module micro-credential programme in strategic supply management for MMC, will begin delivery in September 2023.

Micro-credentials are an emerging solution to the up/re-skilling needs of the workforce, including those related to MMC. National and international governments firmly support both innovations. The author concludes that leveraging government supports and the benefits of collaborating with industry, the education provider can overcome cost and talent barriers, and provide relevant, quality, learner-focused, certified short educational programmes. In a mutually beneficial arrangement, industry can provide insights and expertise and ensure programmes are tailored to meet their specific needs.

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**List of abbreviations:**

CIF	Construction Industry Federation
CPA	Certified Public Accountant
CPSkillnet	Construction Professional Skillnet
ECTS	European Credit Transfers
EGFSN	Expert Group on Future Skills Needs
ESG	Environmental, social and governance
ETB	Education and Training Board
EU	European Union
EY	Ernst & Young
IBEC	Irish Business Employers Confederation
ICT	Information and Communication Technologies
IUA	Irish University Association
MAELD	Master of Arts in Education, Learning & Development
MMC	Modern Methods of Construction
MNC	Multinational Companies
QQI	Quality and Qualifications Ireland
RFT	Request for Tenders
SME	Small medium-sized enterprise
UCD	University College Dublin
UN	United Nations

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## **Introduction**

In July 2023, a micro-credential programme of education was designed, panel approved, and currently awaits formal Quality Qualifications Ireland (QQI) validation. The programme is the result of a successful collaboration between the author's employer and an Irish construction industry representative body. The author's employer is a private education provider, with almost 50 years' experience delivering accredited, award-winning training and education programmes at undergraduate, post-graduate and professional levels. The author is a Certified Public Accountant (CPA), with 17 years' experience in academia - designing, managing, delivering, and assessing education and training programmes at all levels.

This report provides the background to the micro-credential programme and collaboration between the parties. The relevant academic and professional literature on MMC, andragogy and micro-credential programmes is critically analysed, the research methodology undertaken in designing the programme is explained and justified, and the findings presented, and development of the programme explained. The report concludes with a reflection on the final programme design, including teaching, learning and assessment strategies; considers the benefits of collaborations of this nature; and the suitability of micro-credentials, as an emerging education innovation, for the rapid up/re-skilling of the workforce and facilitation of life-long learning.

### *Disruptors in the workplace*

The workplace is experiencing unprecedented change at an exceptional rate. Modern organisations face significant, rapid disruption from advancing digital industrial technologies, and changing legal, regulatory, environmental, societal, and economic requirements and expectations. Stakeholders require organisations to manage these disruptors and demonstrate a commitment to a sustainable and equitable future for all, through effective environmental, social and governance (ESG) practices. According to a survey conducted by Irish Business Employers Confederation (IBEC, 2019) just one in two businesses (51%) understand what is meant by ‘Circular Economy’ and only 39% are aware of European Union (EU) initiatives to drive sustainable change.

Having a robust sustainability and ESG strategy is critical for a modern organisations’ survival. Organisations that ignore these issues or treat them as compliance exercises, face significant risks and consequences, including increased costs and limited access to financial and human capital along the supply chain. According to Liam McKenna, consulting partner at Mazars, approximately 70% of the world’s investment funds are managed by signatories to the Principles for Responsible Investment (The Irish Times, 2021). BlackRock, the world’s largest asset manager, has committed to pushing companies it invests in to achieve net zero emissions by 2050, suggesting it will remove companies from its portfolios if they don’t (The Irish Times, 2021). Organisations must invest in effective environmental, social and governance policies and practices, and human capital requirements, to drive sustainability and manage these risks.

### *Responding to disruptors in the workplace*

‘Agility’ is “The ability to create and respond to change in order to succeed in an uncertain and turbulent environment” (Agile Manifesto, 2001). According to Trevor (2016), building an agile learning organisation is the foundation for continuous creativity, innovation, growth, and sustainability. Employees must continue to learn if organisations are to develop the flexibility, resourcefulness and adaptability for agility and success in this changing environment (Trevor, 2016). By prioritising an inclusive, life-long approach to skills development, organisations create the agility to successfully navigate the ‘new normal’. Quoted in the Irish Times (2022a), Peter Egan, Director of Further Education and Training with Mayo Sligo Leitrim ETB, states “there is

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ample evidence organisations who are on top of learning and development...survive longer, perform better and have a happier, more engaged workforce”. Gensing-Pophal (2021) agrees on the critical link between training, education, and employee retention.

Disruptors are transforming careers and jobs and changing the skillsets required in the workplace. The World Economic Forum *Future of Jobs Report* (2020), Accenture (2021), EGFSN (2015, 2018, 2021), National Skills Bulletins (2015, 2020, 2021), LinkedIn (2022), and others, identify significant demand for technical, green, digital, and transferable skills among employees now and into the future.

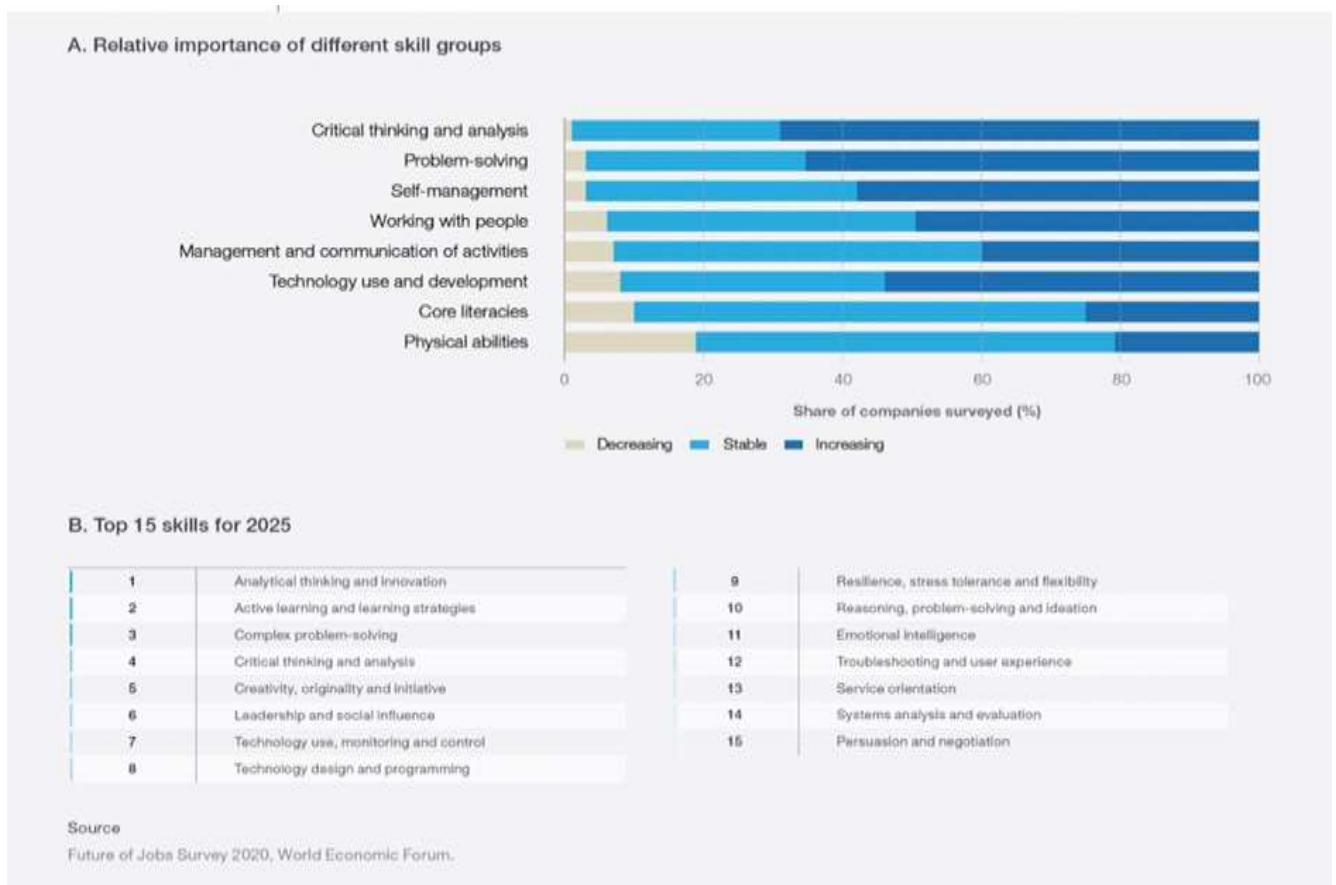


Figure 1: World Economic Forum *Future of Jobs Report* (2020) (online)

IBEC (2021) *Smarter World, Smarter Work* campaign found key employability skills, competencies, and characteristics, can be grouped into three categories: personal leadership, subject knowledge, business acumen.



Figure 2: [IBEC](#) (2021) *Smarter World, Smarter Work* (online)

According to Eurostat (online, 2021), just under 14 per cent of Irish workers aged 25 to 65, participate in lifelong learning, significantly below the EU target of 60% of the adult population participating in annual training by 2030. In Ireland, a huge shift in adult participation in ongoing education is required, if the economy is to remain competitive and successfully navigate the challenges posed by the evolving landscape.

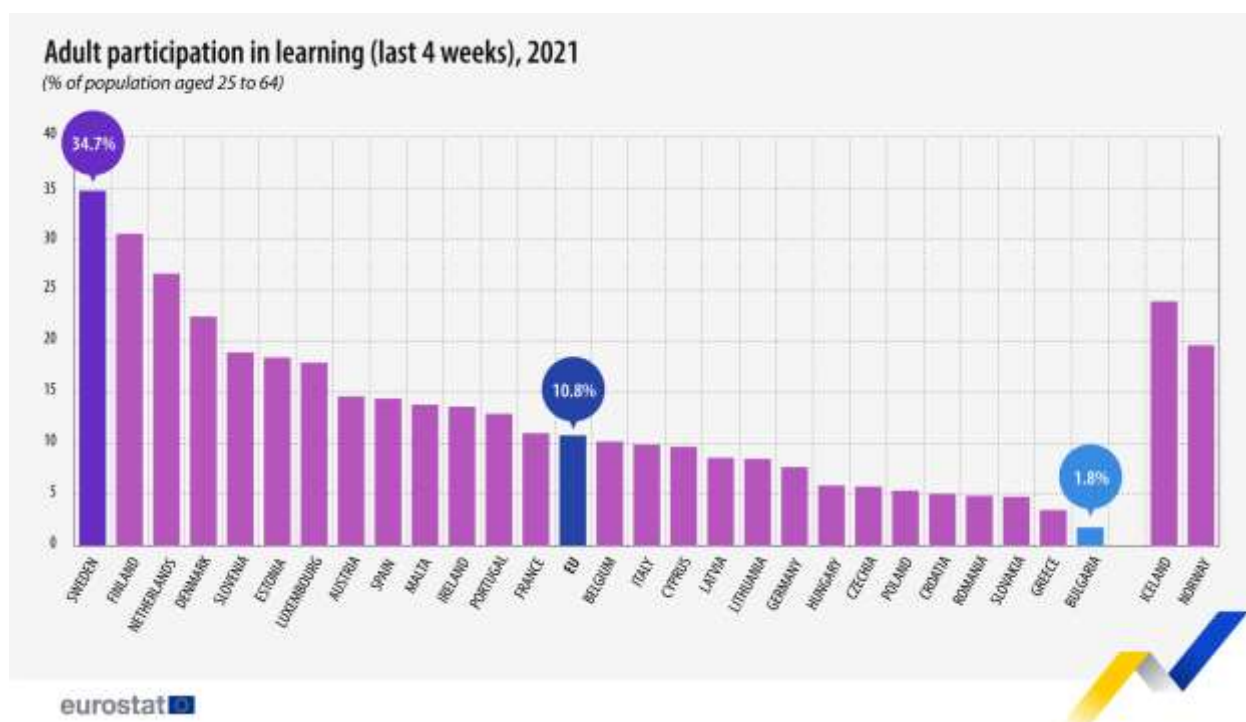


Figure 3: Eurostat Adult Participation in Learning (2021) (online)

Reported in the Irish Times (2022b), based on research carried out by the Professional Academy at UCD; career advancement, improving skillsets and strengthening a curriculum vitae, are the

most likely reasons for individuals to undertake up/re-skilling programmes. 59% of those surveyed identified cost as the biggest barrier to undertaking training and education programmes, followed by ease of access and flexible delivery modes (Irish Times, 2022b). Those most in need of accredited up/re-skilling - the mature learners in the labour force, are engaging less in accredited learning as certification of skills is in greater demand (Oliver, 2019).

The disruption experienced in the world of work is well documented, and up/re-skilling is essential for the survival, sustainability and competitive advantage of workers and their organisations. Mature learners require motivation, encouragement, and facilitation to embrace up/re-skilling and adopt life-long learning for their own professional performance and survival. Boud and Jorre de St Jorre (2021) suggest micro-credentials as a possible solution to the rapid up/re-skilling needs of organisations as they adapt to the 'new normal'. Oliver (2019) states "micro-credentials.....are emerging as potential solutions to the rapid upskilling...required, but the formal qualification system is unlikely to cope due.....to ever-increasing cost".

### ***Disruptors – impact on education***

Education providers, impacted by the disruptors, face a perfect storm according to The New York Times (2020). Education was already impacted by declining revenues and government and industry cutbacks. Significant digital disruption, expedited by the Corona virus pandemic, and changing learner demands and expectations, are potentially undermining the foundations of traditional colleges and universities. Reporting in The Wall Street Journal (2023), Belkin laments the end of the college degree as American's do not see the value in it anymore. It is challenging for private education providers to manage these disruptors, meet the changing needs and expectations of learners and industry, while remaining viable. The education profession, like many others, is experiencing significant talent drain, difficulty attracting new talent, while the cost of providing quality education continues to rise.

Strategic collaboration between industry and education providers can overcome some of these barriers. Industry can provide insight for programme design; expert guest lecturing; researchable cases and authentic real-world assessments; mentoring and partnerships; and sponsoring learners, modules, and programmes. Through collaboration with education providers, industry can ensure accredited education programmes are tailored to meet their evolving needs. Working strategically

with industry, educators can overcome some of the costs and talent barriers and produce graduates with academic underpinning, practical experience, and the knowledge, skills and competencies required for their own professional growth and sustainability, and that of their employer organisations.

### ***Disruptors – responses of national and international governments***

The Irish government is a key stakeholder in both education and the economy. In line with the United Nations (UN) Sustainability Goal # 4 *Quality Education; Ensure Inclusive and Equitable Quality Education and Promote Life-Long Learning Opportunities for All* (United Nations, online); The Irish Programme for Government (2020) identifies up/re-skilling as essential elements underpinning the National Economic and Development plans, and the promotion of life-long learning. The government is committed to initiatives to develop a vast number of education programmes, including short courses, and developing specific skills training in areas of skills shortages and growth, while creating a mind-set of life-long learning among the Irish adult population. The programme plans to provide funding for Higher Education institutions to establish a strategy to develop “new fast-track, mid-career, educational models that can meet the rapidly evolving needs of the new and changing economy” (Programme for Government, online 2020). The programme proposes to leverage EU Green Deal initiatives and scale up assistance for small and medium-sized enterprises (SME’s) to invest in green technologies, energy and waste management efficiencies, and education.

Internationally, The European Year of Skills 2023 (online), through EU initiatives and supports, aims to promote a mind-set of up/re-skilling; help people attain skills for quality jobs and better job opportunities; enable EU citizens to have fulfilling engagement in society, contribute to economic recovery, and ensure transitions to the green and digital economies of the future are socially equitable, just, and fair. According to Ursula von der Leyen, president of the European Commission; “...EU initiatives and investments will focus on matching needs of companies with the aspirations of people, and on professional education and upskilling...” (The European Year of Skills 2023, online).

The Irish Minister for Further and Higher Education, Research, Innovation and Science, Simon Harris, speaking at the July 2023 launch of ‘Microcreds.ie’, stated; “It is vitally important that we make up/re-skilling opportunities easier and more accessible for everyone so that we....address

skills shortages...this platform will allow learners re-enter the workforce, progress in or futureproof their careers”. MicroCreds.ie is a platform developed by the IUA in conjunction with seven Irish universities, offering hundreds of short university accredited courses, addressing skills gaps in the workforce and wider economy (RTE online, 2023).

Collaboration between industry and educators is essential for industry to meet their rapidly evolving up/ re-skilling requirements, and for educators to be able to provide industry focused, certified up/re-skilling programmes in a timely and profitable manner. Existing and planned national and EU government initiatives and support for SMEs, education providers and individuals should be leveraged by all parties for education, sustainability, and future success in this changing environment.

### ***Disruptors – impact on the construction industry in Ireland***

The construction industry is targeted for Irish and EU government supports for both digital and green transition and up/ re-skilling of the workforce. The EGFSN Report (2020) *Building Future Skills – The Demand for Skills in Ireland’s Built Environment Sector to 2030*, recommends a number of priorities for government, including:

- 1. Examine the scope for reforms to Built Environment education, training and qualifications.*
- 2. Developing the skills to enhance the sector’s contribution towards climate change mitigation.*
- 3. Assess the merits of developing a “Skills Passport” for Built Environment activities, to facilitate the recognition of skills or competencies.*
- 4. Engage in ongoing monitoring and evaluation of the demand for Built Environment sector skills.*

In the *Housing for All* July 2023 update, the Irish government published a *Roadmap for Increased Adoption of Modern Methods of Construction in Public Housing Delivery* and committed to boosting innovation and capacity in the construction sector (Gov.ie, online, 2023). Over the next ten years MMC is considered by the construction industry to be of ‘great or very great importance’ in Ireland (EY, 2021).

### ***Background to the artefact***

CPSkillnet is a construction industry representative body, with the objective to support the development and growth of SME construction businesses in Ireland. By working with these businesses, CPSkillnet aims to identify their skills needs and address them by providing construction industry specific training and development solutions (CPSkillnet, online).

To address the MMC knowledge and skills deficits, in January 2022 CPSkillnet issued a Request for Tenders for provision of the design and delivery of a QQI Certified Level 8 micro-credential in ‘an area related to’ MMC’, exclusively for CIF members and sponsored by CPSkillnet. On behalf of the employer, the author successfully tendered for the CPSkillnet programme. The author researched and designed a bespoke level 8, 15 ECTS, micro-credential programme (hereafter referred to as the ‘pilot programme’). The pilot programme was validated by QQI in January 2023, launched by the aforementioned Minister Harris in government buildings (See Appendix 12), and the first iteration successfully delivered in early 2023.

Following on from this strategic collaboration, in January 2023 the author submitted a successful tender to CPSkillnet to research, design and validate a second bespoke QQI level 8 micro-credential programme. Hereafter this programme will be referred to as the ‘artefact’ and is the subject of this report.

This next chapter in the report provides a review of current literature on MMC and a critical assessment of the literature on andragogy and micro-credential programmes of education.

The research methodology chapter explains and justifies the research methodology undertaken, details the research findings and the resulting design and development of the artefact.

In the concluding chapter the author reflects on the collaboration and suitability of micro-credential programmes of education for up/re-skilling, including valuable learnings for the author, private education provider, industry, and government.

## Literature Review

As an emerging, innovative, construction business model, it is acknowledged there is currently limited MMC related literature. The author critically assesses the available literature on MMC, andragogy and micro-credential education programmes, including blended delivery modes.

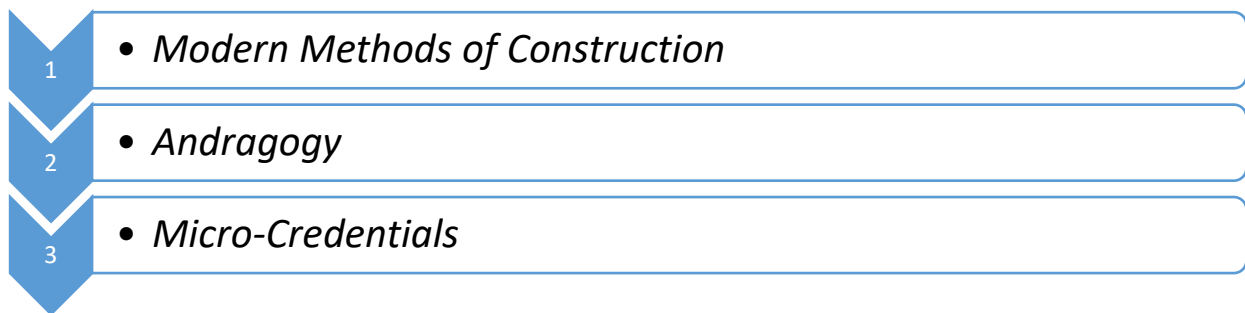


Figure 4: Topics for literature review (Source: author)

### *Modern Methods of Construction (MMC)*

According to the UN World Urbanisation Prospects Report (2019), Ireland's, and particularly Dublin's population, is predicted to increase significantly over the next 25-30 years, with subsequent demand for housing, buildings, industrial facilities, data centres, hospitals, schools, infrastructure projects etc., but this demand cannot be fulfilled by the present construction industry capacity in Ireland (EY, 2021). Labour shortages, digital transformation, increased regulations, climate change, materials scarcity, and Brexit, all exacerbated by the Covid-19 pandemic and the war in Europe, have caused significant disruption and subsequent slow-down in the Irish construction sector. The Irish National Development Plan, including the requirements of *Project 2040*, *Housing for All*, and the *Retrofit* programmes, has increased demand on the construction sector, but the industry is lacking the capacities and capabilities required to deliver on these ambitious projects (EY, 2021).

MMC provide a solution to address many of these issues. According to a CPSkillnet report (2022); *Modern Methods of Construction: Defining MMC Business*; MMC describes an approach to “constructing buildings more quickly, reliably and sustainably, using methods such as off-site manufacturing, modular construction panels or light steel framing, structural insulated panels or cross-laminated timber”.

An Ernst & Young (EY, 2021) report; '*A Detailed Description of the Needs for the Irish Construction/Built Environment Sector*', identifies the MMC approach to building as having the potential to increase the speed of new builds by 30%, reduce costs by potentially 25% and advance quality and energy efficiencies. This is attractive to government as it presents an opportunity to meet the National Development Plan and EU climate change and emissions targets. These benefits, coupled with pressures from increasing legal and regulatory requirements, rising costs, construction skills and labour scarcities, new material technology, improved industrial processes and digitalisation, are advancing a shift towards MMC in Ireland. According to EY (2021); "while 62% of firms believe that modular construction will be of 'great or very great importance' in the next 10 years.... utilisation of MMC in Ireland remains low with just 7.4% of firms regarding MMC as their main activity". A significant barrier to the adoption of MMC in Ireland is the availability of skills and knowledge (CPSkillnet, 2022). While the roles of those working along the construction value chain will remain, the implementation of MMC requires a different business model, mind-set, and additional skillsets to traditional construction. A blend of construction, manufacturing and supply chain management competencies creates the skillset required for effective operation of the MMC business model (CPSkillnet, 2022).

EY (2021) recommends the establishment of a bespoke Construction Technology Centre to address the needs of the industry, and identifies three core areas of focus as *People, Process* and *Technology*. Regarding *People*, it recommends the "Provision of effective and accredited training in collaboration with local academics/universities, to improve the capabilities of the construction workforce" (EY, 2021). Training and education providers have a significant role in developing solutions to address the MMC skills gaps in the construction sector. However, many of the existing training and education programmes focus on traditional construction methods, and there is a general lack of knowledge and understanding of MMC and off-site manufacturing. The current training programmes include apprenticeships, and QQI accredited level 7, 8 and 9; two-, three- and four-year academic programmes, with none addressing the specific requirements of MMC.

In conclusion, MMC related rapid up/re-skilling short programmes are necessary to help the industry successfully adapt to this innovative construction model. Education providers have a

significant role in developing accredited short courses in MMC skills and competencies, in collaboration with the construction sector. These short courses should be aimed at mature, qualified, trained, and experienced learners and meet the needs of the target learners and their employers.

### ***Andragogy***

According to Forest *et al.* (2017), the term ‘andragogy’ refers to the education of an adult learner and an educational experience that builds independent, adaptable, knowledgeable individuals. Knowles (1977) noted the great historical teachers in ancient China, Greece, Rome and elsewhere, were teachers of adults, who made assumptions about learning processes, based on their experiences of teaching adults. Through case study analysis and dialogue, learners had the primary, active role in the learning process, and the teacher acted as facilitator, guide, and resource provider (Knowles, 1977).

Working on Knowles’ assumptions about adult learners; (1) self-concept, (2) prior experience, (3) readiness to learn, (4) learning orientation, and (5) motivation to learn; Pratt (1993) draws two inferences about andragogical perspectives on adult learning processes. According to Pratt (1993), a world exists, and it is the individual's personal experience of it that is most important to their learning. Pratt (1993) explains that andragogy is not about the discovery of an independent, pre-existing world, but more an individual’s construction of meaning of that world, through experience and a subjective concentration on one’s own “interpretation, integration, and even transformation of knowledge, based on individual experiences” (Pratt, 1993). Andragogy therefore assumes that learners do not passively receive knowledge from the environment, but knowledge is instead actively constructed by each learner. Consistent with the views of Knowles (1977), Forest *et al.* (2017) posits that four assumptions regarding learning underpin andragogy; self-directing self-concept; use of experience; a willingness to learn; and a performance-centered orientation to learning.

Pratt (1993) critically posits that andragogy, as a concept and practice, suggests individual adult learners construct meaning outside of the influence of the social structures that have moulded them over many years. Andragogy therefore minimalizes the significant influence social structures have in forming the individual’s personal identity and the manner in which they

interpret the world, and how this impacts their learning. Cognitivism and constructivism, as terms of epistemological/ cognitive processes, believe learning occurs with active, goal-oriented processes where knowledge and understanding is constructed through the interaction of the individual and the environment.

Bandura (1977) posits that learners learn individually and also model their behaviour from observation and interaction with peers. Through observation of others, learners acquire knowledge, rules, skills, strategies, beliefs, and attitudes and the usefulness and appropriateness of behaviours. The consequences of certain behaviours are observed, and learners act according to a belief about their own capabilities and the expected outcomes of their actions.

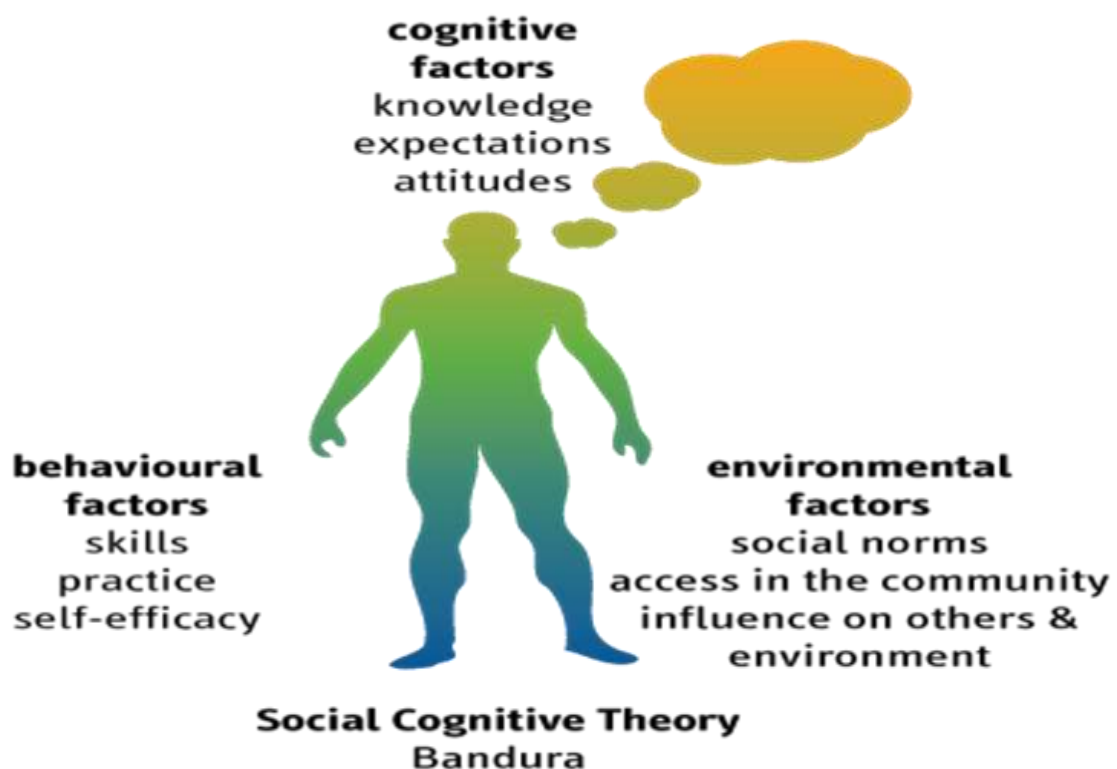


Figure 5: Albert Bandura: Social Cognitive Theory. Available at:

<https://h1250wt2014.weebly.com/key-points.html>

According to Biggs (1991) teaching is the efficient blend of teaching skills and a range of diverse teaching techniques to develop higher order sophisticated thinking skills. According to Schunk (2012) learning occurs where there is a combination of enactive and vicarious experiences.

To summarise, an appropriately designed educational programme for mature learners acknowledges them as self-directed, motivated, goal oriented, independent, and experienced learners. Provided with diverse, enactive, and vicarious learning experiences, the learner learns individually and from their environment and is empowered to self-direct their learning to meet personal and professional needs and achieve growth.

### ***Micro-credential educational programmes***

In today's rapidly evolving digital world, stakeholders are questioning the appropriateness and relevance of traditional education courses. Craig (2015) believes degree programmes offer poor value for the significant financial and time commitments required to successfully complete them. As education is disrupted by the digital technological revolution, Craig (2015) argues the unbundling of online degree programmes offers learners more graduation, employment and wage opportunities.

In the post Corona virus pandemic period, governments endeavoured to return people to the workplace, create new jobs in growth areas, and address specific skills shortages, resulting in increased interest in and demand for rapid, relevant up/ re-skilling programmes of education. The Porto Skills summit in May 2023 introduced '*The European Skills Agenda*' (European Commission, online). This five-year plan is to help individuals and businesses develop more and better skills to strengthen sustainable competitiveness across the EU; ensure social fairness for EU citizens through access to education, training, and lifelong learning; and build resilience to react to future crises by leveraging lessons learned from the Covid-19 pandemic (European Commission, online). The European Council's aim is to assist EU citizens to update or complete their skill sets in a more flexible and targeted way and makes recommendations on *Individual Learning Accounts* and *Micro-credentials*.

The term 'micro-credentials' in education, indicates smaller units of study, shorter than traditional forms of accredited education that normally lead to qualifications such as degrees (Brown *et al*, 2021). 'Small' refers to the credits associated with the award (QQI, 2021). Brown *et al* (2021) conclude that in Ireland and beyond, "micro-credentials are likely to become a more established and mature feature of the 21st-century credential ecology over the next five years". The key drivers of micro-credential education programmes include the promotion and facilitation of lifelong learning; upskilling/re-skilling as part of governments' COVID recovery plans; training

in growth areas; and educational responses to digital and green transformation. By meeting the lifelong learning needs of the workforce, micro-credentials have the potential to help organisations rapidly manage and navigate the changing work landscape caused by disruptors, including technological and social transformations (QQI, 2021).

While confusion exists over what exactly a micro-credential is, the European Commission has endeavoured to achieve clarity by providing a definition. A micro-credential is explained as evidence of learning outcomes that a learner has achieved following a short learning experience, with these learning outcomes having been assessed against transparent standards (European Commission, as cited in Brown *et al*, 2021). The definition and clarity are significant. The implication is that micro-credentials are embedded within national qualification frameworks, recognised as stand-alone, stackable, and portable qualifications, and underpinned by quality assurance. The efforts of the European Commission in this area will advance a common understanding of micro-credentials and facilitate an alignment of micro-credentials with national qualification frameworks and the Bologna process. Accredited micro-credential programmes are new, but with the establishment and promotion of coherent, consistent key principles on micro-credentials, Europe can foster nationwide and pan-European level adoption and recognition of these programmes.

According to Brown *et al* (2021), Ireland has a significant global reputation for its pioneering work in micro-credentials. For many years, the Irish awarding body, QQI, has made minor, special purpose and supplemental awards in the Higher Education and Training sector, but the term ‘micro-credential’ has not been used to describe these awards previously. According to QQI (2021)

“micro-credentials have captured the imagination of Irish Higher Education institutions.....and the infrastructure for small higher education qualifications is long established in the Irish higher education system. What is new for Ireland is the term ‘micro-credential’ and that the concept.....has gained international acceptance and recognition”.

In 2020, QQI piloted the validation of six new micro-credential programmes. The success of the project contributed to the Irish government’s commitment to significant funding for Higher Education Institutes to develop a national system of micro-credential programmes, by extracting

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in-demand modules from existing programmes and repurposing them to meet industry and learner needs. According to Brown *et al* (2021) this project is the first of its kind in Europe and highlights Ireland as a thought leader in this education innovation.

Boud and Jorre de St Jorre (2021) acknowledge micro-credentials as potentially less expensive and more flexible opportunities for learners to gain macro-credentials, by stacking the micro-credential with conventional course programmes so that a macro qualification is constructed from a hybrid of the two. However, assessing the achievement of macro programme learning outcomes may be difficult, resulting in a lack of confidence that the overall programme learning outcomes are met. Examination and re-imagining of assessments of programme and module learning outcomes is required, along with more longitudinal studies on the topic (Boud and Jorre de St Jorre, 2021).

Micro-credential programmes typically involve blended or online delivery modes. According to Garrison and Vaughan (2008) blended learning involves the integration of the strengths of face to face (ftf) and online learning, to create a modern learning experience. Blended learning mixes ftf classes with web-based materials, leveraging the developments in ICT to complement traditional learning (Mitchell & Forer (2010) as cited in Lopez-Perez, 2011).

In summary, micro-credential programmes are considered a modern innovative education model, suitable for meeting the rapid up/re-skilling needs of industry and employees. Formal recognition of these education programmes by education institutes, industry, and national and international governments, gives credence, currency, and transferability to these programmes of education, increasing the attractiveness to learners and employers. The short time period required to complete the programme, reduced cost, and flexible delivery, coupled with the significant funding available, ensures that learners are enabled and encouraged to undertake these courses and employers are motivated to facilitate them to do so.

This chapter outlines and justifies the research methodology adopted by the author to gather the information required to determine the most appropriate and effective design of the proposed micro-credential. The research aims and objectives were to provide evidence-based justification of the need for the programme; identify the target learners; determine the relevant design of programme/ module learning outcomes, aims and objectives, content and weightings, delivery and assessment methods, and overall andragogy.

### **Research philosophy, approach, methodology and ethics**

#### *Research Philosophy*

Research philosophies are the assumptions with which researchers view the world (Saunders *et al* 2009). Epistemology, as a branch of research philosophy, is concerned with the nature of knowledge; what it is, how the knowledge is acquired and the extent to which something can be known and understood. Interpretivism is one philosophical pillar of epistemology that posits the social world cannot be studied in similar ways to the natural world. Interpretivist research seeks to analyse and understand why individuals might act as they do, and thereby interpret and understand social meanings and gain relevant understanding of individuals' perception of reality.

#### *Research approach and methods*

Saunders (2009) classifies an inductive research approach as more closely aligned to interpretivist research philosophy and involves the researcher developing assumptions from a literature review, and testing those assumptions using qualitative research methods. The literature is organised logically and sequentially (Collins and Stockton (2018) as cited in Whitaker *et al* (2021)), allowing the researcher to develop an understanding and identify suitable questions for the primary research phase. Qualitative research methods such as focus groups, observations and structured/ semi-structured and/ or unstructured interviews are deployed on small sample sizes, to gather information and gain in-depth understanding.

Silverman (2019) describes qualitative research as “*the type of research that finds out about people's experience...and helps to understand what is important for people*”. Personal meanings and experiences are considered, allowing the researcher to understand the phenomena on a deeper,

more personal level than is achievable through quantitative research methods (Silverman, 2019). Generalisation is not the objective and quality over quantity of information is considered most important (Koerber and McMichael, 2008).

### *Research ethics*

Research ethics refers to the morals, rules, and ethical considerations that researchers use to guide the research, act in a proper, fair, and lawful manner, and eliminate risk of harm to those involved in the research (Gray, 2018). According to Silverman (2021) the three main ethical problems researchers face are consent, confidentiality, and trust. The researcher obtains consent, avoids gathering unnecessary personal data and gains trust by acting appropriately and respecting the privacy of all research participants.

### **The research methodology adopted in researching for the artefact**

The author chose to apply an interpretivist research philosophy, inductive approach, and qualitative methodology, in the research for the artefact. The personal experiences of the target learners and their needs and wants, and the specific requirements of the client and other stakeholders, were essential elements in the design of the artefact. The researcher considered all relevant stakeholders, including the private education provider, CPSkillnet, CIF, CIF member/target learners and QQI. (See Appendix 6).

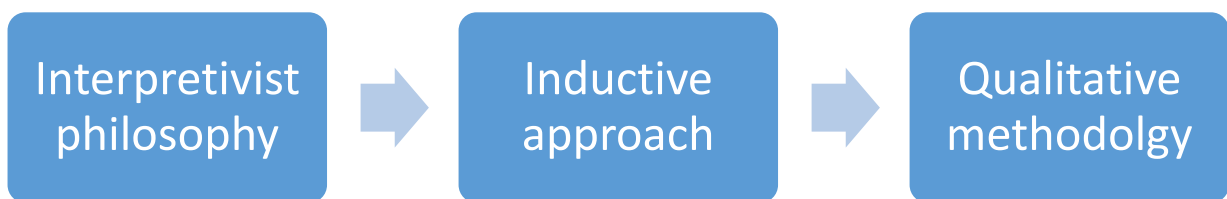


Figure 6: Research Methodology. Source: Author

In March 2022, while designing the pilot programme, the author conducted a desk review of the CPSkillnet MMC report (2022). In researching for the MMC Skills Needs research report, *Modern Methods of Construction: Defining MMC Business* (CPSkillnet 2022), CPSkillnet conducted an investigative study using both primary and secondary sources, and qualitative and quantitative methods, to determine the extent of national uptake of MMC and barriers to it. In March 2022,

when designing the pilot programme, the author reviewed this report and other relevant literature on MMC, attended a focus group discussion and conducted interviews with construction industry stakeholders. The author retained detailed narrative notes from this research.

In 2023 the author conducted the research for the artefact, and used desk review and qualitative research methods including focus group, in depth interviews, and surveys to gather primary data.

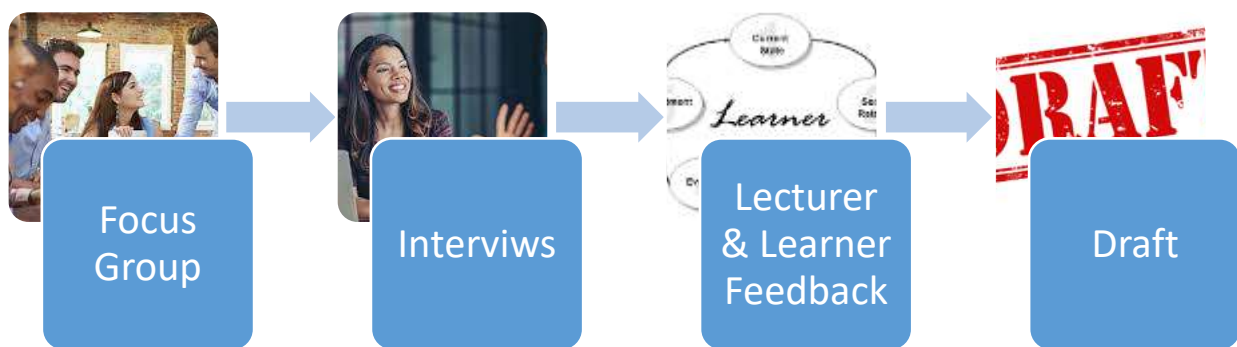


Figure 7: Primary Research Methods. Source: Author

#### *Desk review and follow-up*

The author initially consulted relevant up-to-date MMC literature and industry reports, and revisited the narrative notes taken during the research in 2022. In addition to the requirements of the client as expressed in the RFT, this information formed the basis of the author's assumptions about MMC related up/ re-skilling needs of the SME construction sector in Ireland. The author refined these assumptions in a detailed meeting with the client in advance of focus group discussions with CIF members and other construction industry representatives in March 2023.

#### *Focus group and follow-up interviews*

The purpose of the focus group was to test the author's assumptions about the MMC related education needs of target learners. Focus group attendees included SME owner/ managers and members of CIF; representatives from larger construction and related firms along the construction value chain (particularly those with MMC experience); and CPSkillnet and CIF representatives (See Appendix 7). The focus group discussions revealed the additional skillsets required to

effectively operate MMC, and the many roles along the construction value chain in need of upskilling and re-skilling.

The focus group findings were documented on a Miro board, grouped according to their interconnectedness and relationships, and ranked in order of importance as determined by the focus group. The professional backgrounds of the focus group members were diverse, including, architects, engineers, business development managers, project managers, main contractors, sub-contractors, tradesmen, manufacturing managers, raw materials suppliers, among others. It was difficult to reach a consensus on the skills required and order of importance, and there was disagreement and robust debate.

In addition to the Miro board, the author took narrative notes during the focus group discussions, which were recorded, with permission from the organisers and participants. Post focus group, in-depth one to one interviews were conducted with the client, to obtain clarity and understanding of technical and industry specific terms. The narrative notes taken by the author were triangulated with the notes on the Miro board and the results of the in-depth discussion with the client, to ensure insights and understanding of requirements and needs were correct.

#### *Feedback from learners and lecturers on the pilot programme*

Feedback was also obtained from stakeholder in the pilot programme, a three module, 15 ECTS, micro-credential programme, designed in 2022 exclusively for CIF members. This programme, was the first of its kind to address MMC training needs of construction professionals in Ireland and concentrates on the soft skills requirements for effective MMC operation. These skills are considered necessary to effect the required change in behaviour associated with traditional construction, reputed as aggressive and confrontational with a win-lose focus regarding the treatment of stakeholders along the value chain.

As the first group to undertake a MMC micro-credential education programme, designed by the author on behalf of the private education provider, in collaboration with CPSkillnet, learner feedback on the pilot programme was considered vital for designing a quality learning experience on the new programme. Learners on the pilot programme were surveyed (See Appendix 8), however the survey response rate was low (27%). Additional feedback was obtained through

telephone discussions with three learners. Attendance, participation, and completion rates and grades were considered. Learner reflections were analysed to gain insight into the learning experience and the learner perception of the success or otherwise of this pilot programme.

Feedback was also obtained from the lecturing team on the pilot programme. Semi-structured interviews with predetermined categories and open-ended questions were conducted with the lecturers on the programme. The interview flow depended on the interviewee's answers which were allowed to steer the conversation towards the content they deemed relevant. A guiding list of interview questions were prepared in advance (See Appendix 9). Interviews took place in person, informally in relaxed settings, and the author took narrative notes in a research notebook. The author additionally considered external examiner feedback.

### **Ethics**

The author was a guest participant in the focus group discussions arranged by the client, and obtaining participant consent to use the focus group findings in the design of the artefact was the responsibility of the client. The group was informed the author would write a report on the artefact, including the role of the focus group. Permission was obtained from the group with a show of hands and no dissenting voices, captured in a zoom recording. The client gave permission, via email, for the author to use all information gathered from them in the design of the artefact and in this report. Lecturers and learners on the pilot programme were assured anonymity when requested to provide a summative quote for use in this report. All were informed of the purpose of the report and assured anonymity. All contributors provided permission via email.

### **Limitations in the research methodology**

*Author:* The author has no expertise in the construction sector and relied on the research methodology to provide the information for programme design. The author may misunderstand the requirements of the client, the target learners, and the construction industry representatives. The author has attempted to manage this limitation through multiple research methods, consulting with experts, and requesting the client's final sign off on the programme.

*New and emerging business model:* As MMC is a new innovation in construction, and uptake and understanding is relatively minimal in Ireland at this time, the research participants may not fully understand their needs and may not provide appropriate information for the design of the artefact.

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The author and client attempted to minimise this by including MMC experts in the focus group discussions, but these participants come from large MNCs and their experiences may not be representative of the needs of SMEs along the construction value chain in Ireland.

Diverse research participants: The diverse backgrounds and competition between the research participants, particularly employers, resulted in difficulties reaching consensus. The author requested the client’s sign off on the programme, but the final programme may not meet the needs of all stakeholders.



## **Research Findings and Discussion**

### *Focus group and interview findings*

MMC competencies' requirements are varied and involve technical, legal, general, and specific knowledge across construction, manufacturing, procurement and supply chain, and business management. The literature review, focus groups and in-depth interviews identified the skillsets required for effective MMC operation as: MMC understanding; Collaboration skills; Quality assurance and quality control; Construction materials knowledge; Planning and scheduling skills; BIM skills; Regulatory knowledge; Supply chain management; Risk management; Manufacturing knowledge; Lean principles skills and logistics. Consistent with the findings of many employment surveys, personal, and interpersonal skillsets were identified as essential skills for commercial relationship management of internal and external stakeholders, considered a very important feature of this emerging business model.

The research also identified the following construction and related roles in need of significant up/reskilling for effective operation of MMC: Riggers and logistical operators; Factory floor supervisors; Quality control/ Quality assurance; Production managers; Procurement manager; MMC buyers; Quantity surveyor; Finance managers; Human resources managers and Business development managers.

Meetings and interviews with the client established that time and budgetary constraints dictated there would be a 10ECTS, one module programme, concentrating on the area of procurement and supply chain management for MMC. The target learners were identified as CIF members with a cognate level 7 or higher award, and/ or related, sufficient experience in the industry, working or intending to work in procurement, supply-chain and related roles, or senior management roles along the construction value chain. Due to the experienced nature of the learner cohort, it was agreed the programme would be designed at level 8 on the Irish education framework.

### *Findings from feedback from stakeholders in the pilot programme*

Learners' experiences on the programme were predominantly positive and feedback was critically constructive. Expectations of the programme and the ultimate experience differed somewhat, but not disappointingly. Learner reflections confirmed their satisfaction at undertaking the

programme, the personal and professional improvements achieved, and the networking and peer learning opportunities provided.

**Learner #1** highlighted that *'.....construction industry has long been reputed as being confrontational....with a historical reluctance to change, and creating the required collaborative culture across so many disciplines, necessary for effective MMC operation, is not a facile undertaking....the industry is on the cusp of significant change...and this course encouraged me to take a reflective look at myself first and foremost, and the role I must play as a senior executive, in building the required culture in my own organisation...'*

**Learner #2** noted: *"The construction industry is changing and cannot survive without MMC. The change process will be slow, but it is the way forward and is something I want to be a part of. Having no formal 3<sup>rd</sup> level education, I was unsure what to expect from this course. I found it very engaging, supportive and interesting, and it provided me with learning and skills that I can take back to my company to help us both grow. The industry project forced me to review current practices in my own organisation and consider how the adoption of MMC could improve performance and efficiency and reduce time and waste. I might not have undertaken this review without the project and the guidance and learning from the programme. It is a real tangible benefit for me and my organisation"*

**Learner #3** commented: *'This programme has been very informative, and I learned important lessons about business and supply chain strategies that can be related to construction and MMC projects. Understanding how other industries have managed change and applying the same learnings to construction is very doable, and this course has taught me that and provided me with insight of how to do just that...'*

The lecturers on the pilot programme provided feedback on programme and module learning outcomes, content, teaching, learning and assessment strategies, learner engagement and resources.

**Lecturer #1** commented: *"Providing lectures on this pilot programme has been an exceptionally refreshing experience, as its content ventures into uncharted territory. The feedback received from learners was particularly enlightening, with several expressing how unexpectedly transformative the module has been in enhancing their role performance. Learners have reported feeling*

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*equipped with valuable techniques for openly questioning matters without fear of potential conflicts. This feedback has had a profound positive impact on my own professional performance as well. I feel I am contributing to an industry at an exciting time as it transitions to a more sustainable business model”.*

**Lecturer #2** commented: *This programme is structured to equip professionals in the construction industry with knowledge, expertise and skill sets to manage collaboration across complex and evolving supply chains. The construction sector is experiencing unprecedented change, comparable to that of other manufacturing industries in recent years, and the programme offers construction professionals the opportunity to step outside of their industry and comfort zone and gain a different perspective - and indeed understanding - of how strategic collaboration leads to success. The programme instils a number of key skills which can be readily incorporated/implemented across the supply chains of construction companies with game-changing results. The construction industry is on the cusp of real change, and it was refreshing to see senior experienced professionals open to embracing the change and eager to understand how to manage it. They will be true leaders leading the charge forward in their industry.’*

The information gathered from the literature review, focus groups, interviews, in-depth discussions with the client, and feedback from stakeholders in the pilot programme, have all been considered in the design and development of the artefact.

## **The development of the artefact: 10ECTS micro-credential programme**

### *Programme and module design*

The information gathered from the literature review, focus group discussion, and in-depth meetings with the client, determined the decision to design a level 8, 10ECTS, one module micro-credential programme on the topic of procurement and supply chain management for MMC. The feedback determined the choice of programme / module learning outcomes, aims, objectives, and content. In line with QQI’s requirements relating to micro-credentials, the author chose one 10 ECTS module from the final year of a QQI validated level 8 honours degree programme delivered by the education provider, and re-purposed it as a 10ECTS micro-credential, specifically adapted for the client and construction sector, based on the feedback.

One significant theme in the feedback from the pilot programme, concerned insufficient examples of MMC projects. The pilot programme timetable included MMC case presentations at induction

and MMC expert guest speakers to present to the learners throughout the programme. Securing the services of these experts proved difficult and ultimately there were insufficient expert presentations to satisfy the learners' demand. In response, the author included a MMC related module learning outcome and MMC specific content in the proposed programme and the education provider will engage a MMC expert to deliver this.

### *Teaching, Learning and Assessment Strategy*

As per Knowles (1977) and Forest *et al* (2017), an appropriate educational programme for mature adult learners acknowledges the self-directed, motivated, goal oriented, and experienced learners. Independent learners and stakeholders in the proposed programme, professionally connected through a shared goal of improving and advancing the construction sector, will learn from their environment and interaction with peers (Bandura, 1977), when provided with enactive and vicarious learning experiences (Schunk, 2012) that promote higher order thinking skills (Biggs, 1991). The feedback from stakeholders in the pilot programme influenced the design of the teaching, learning and assessment strategies. Subject matter expert lecturers will be engaged to create the appropriate learning environment and guide the learners with case studies; promote dialogue, challenge, discussion, and debate; and facilitate a sharing of experiences and ideas. Alluding to Bandura (1977) and the importance of modelling behaviour, MMC, manufacturing and supply chain expert guest speakers will provide opportunities for learners to model behaviour of success stories, and avoid failures. The teaching and learning strategies adopted in the programme reflect these positions. (See Appendix 10).

An industry-based assessment, applicable to the learner's employer organisation was adopted, based on the success of a similar assessment strategy in the pilot programme as evidenced by positive feedback from learners, lecturers, and external examiner. The assessment strategy allows learners to apply their learning to their workplace, review and potentially improve practices. The work-based assessment strategy is consistent with Forest *et al.* (2017) view of the adult learner as self-directing, user of experience, with a goal and performance-centred orientation to learning. For the employer and the employee, a successful programme should lead to changed behaviour and better workplace decision-making. The evaluation of the success, or otherwise, of the programme, requires an investigation of whether knowledge has transferred successfully. Kirkpatrick's Training Evaluation Model (1975) is a useful tool to assess this.





Figure 8: Kirkpatrick's Training Evaluation Model. Image available at:

<https://educationaltechnology.net/wp-content/uploads/2016/10/kirkpatrick-model-four-levels.png>.

*Draft document and feedback*

The proposed programme documents were drafted, including programme/ module learning outcomes, aims and objectives; module content; teaching, learning and assessment strategies and recommended reading lists. The draft was distributed to all stakeholders and feedback solicited. A MMC expert was engaged to review the MMC module learning outcome, content, and weighting. Similarly, a discipline expert lecturer was engaged to review the procurement and supply chain module elements. The resulting additional feedback from the focus group attendees, subject matter experts and the client was considered, and amendments made to the programme document as deemed appropriate. The final programme document was completed and approved between the author and client and the author completed the QQI validation documents. These documents were submitted to the education provider's Quality Assurance Department for consideration. In July 2023, two months later than anticipated, the academic and industry expert panel formally approved the programme with commendations and recommendations (See Appendix 11).

.....

**Conclusion**

Micro-credentials are an innovative education model that can be tailored to meet industry up/ re-skilling needs, and are attractive to learners and employers due to the short time commitment, flexible delivery and reduced cost. National and international recognition and support for micro-credentials promotes a mind-set and facilitates the life-long learning necessary for professional survival and growth and managing modern workplace disruptions. Mutually beneficial collaborations between education providers and industry can ensure micro-credentials are properly designed, delivered and assessed for the benefit of learners, employers, education providers and society at large.

The successful collaboration between the author’s employer and CPSkillnet, on two micro-credential programmes, paves the way for more collaborative projects of this nature, between the education provider, client and other stakeholders.

**Opportunities emanating from the research**

*Collaboration for competitive advantage:*

The recent launch of Microcreds.ie platform is indicative of the demand for this type of education. Small private education providers are unable to compete with such a platform and generic programmes, but may be competitive through collaboration. The collaboration between private education providers and industry demonstrates how bespoke programmes can be created, tailored, and targeted to the needs of specific clients and learners. The education provider has a significant role to play in providing relevant up/re-skilling programmes, and the government and EU drive and supports makes collaboration on micro-credentials feasible and attractive for organisations who wish to build agility (Trevor, 2016).

*Further micro/ macro-credentials for the construction industry:*

Based on research findings, there is a variety of MMC, green and digital transformation up/re-skilling requirements, providing opportunities for the development of more micro-credential programmes. There are additional opportunities to stack these micro-credentials to create a macro education programme in MMC, while remaining cognisant of the concerns expressed by Boud and Jorre de St Jorre (2021).

The success of the collaborations in 2022/ 2023, acts as a template for further collaborations of this nature between the education provider and industry. This is evidenced by a similar project between the private education provider and Irish Hotels Federation, in the design, delivery and assessment of bespoke micro-credentials aimed at those employed in the Irish hotel sector.

*Industry connections:*

Collaborating with industry stakeholders, including SME owner/ managers, creates a network of expertise and opportunities for the education provider. Carefully nurtured relationships can produce guest speakers, sponsors, authentic real-world assessments, research opportunities, panels for guidance and insight, graduate progression opportunities, and significant other opportunities, to be leveraged by the education provider in the best interests of learners, graduates, employers, and programmes.

*Government supports:*

There are very significant EU and Irish government supports available to support micro-credentials and life-long learning. These should be investigated, harnessed, and leveraged by education providers and industry to help navigate the changing world and manage the financial, human capital and other associated risks.

**Limitation in the research**

*Timeliness of programme:*

The purpose of micro-credential programmes is the rapid up/ re-skilling of people, however, the validation process remains bureaucratic and frustratingly slow. The delay may influence the relevance of a programme in this rapidly changing environment. Learning outcomes must be written broadly and expert lecturers and guest speakers employed to keep content current. Awarding bodies such as QQI, could consider the arduous and time-consuming validation process and the impact this has on meeting the needs of industry and employees in a rapid manner.

**Final thoughts**

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As identified in the many employment reports and surveys previously mentioned, jobs and the skillsets required, are changing. Bould & Jorre de St Jorre (2021), Oliver (2019) and Brown *et al* (2021) consider micro-credentials as an emerging solution to the up/re-skilling needs of the workforce, including those related to MMC. National and international governments firmly support both micro-credentials and MMC, as evidenced by the Irish government launch of the pilot programme; microcreds.ie; and the July 2023 *Housing for All* Roadmap on the use of MMC.

The author, education provider and client are delighted this second micro-credential programme addressing MMC skills shortages in the construction sector, is panel approved and ready for delivery. The education provider will continue to nurture this mutually beneficial relationship, and continue to collaborate on other micro-credentials for the Irish SME construction sector. It is essential the financial supports and other national and international initiatives continue to champion this innovation in education and the subsequent life-long learning required for economic, environmental and societal survival and progression, in light of the significant disruptors we now face.



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## Appendix 1: Learner Contract

Learning Contract for Submission of Dissertation submitted in partial fulfilment of the requirements for MA in Education and Learning Development (QOI)

Name of Learner: Suzanne Burdis
Name of Supervisor: Lloyd Scott

To be completed by both learner and supervisor – only tick if you are both satisfied

Yes

Have you read the guidelines for supervisors and learners on completing a dissertation/dissertation by practice?

Yes

Are you aware of the final date for submission of work and the dates of dissertation presentations?

Yes

Have you discussed with each other the format of how drafts of learner work will be given to the supervisor e.g., hard copy, email, both?

Please give details of the format:

Email
-------

Yes

Have you discussed how feedback is to be communicated and the 'turnaround time' for feedback (especially during the summer months)?

Please give details:

Email at a time that is suitable for the supervisor
---

Please see second page of document →

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Yes

Have you discussed where and when and how often you will meet?

Please give details:

As required, on zoom, based on mutual availability

Briefly outline the timeline you have agreed for submission of your work in progress, using the main components of the dissertation as a guide i.e., dates for literature review, methodology, analysis chapters.

Artefact to be completed by beginning of May 2023, in line with employer and client expectations

Begin dissertation by practice report soon after artefact is complete and submit work as it is ready – supervisor acknowledging a mature learner at a very busy time in the academic calendar.

Learners would normally submit a very good final draft to their supervisor before final submission with enough time for supervisors to comment and learners to make amendments. With this in mind what is the agreed date for this draft to be submitted and how will material be submitted e.g., email, hard copy?

Agreed date for final **draft** submission to supervisor: \_\_\_\_\_ Email final draft in week assignment is due

\_\_\_\_\_

Format of the **draft** submission: \_\_\_\_\_ Email \_\_\_\_\_

**The signatures below indicate approval of the contract:**



\_\_\_\_\_  
Learner Signature

Date: 24<sup>th</sup> February 2023


\_\_\_\_\_  
Supervisor Signature

Date:

## Appendix 2: Learner Progress Report

### Learner Progress Report (per meeting)

MA Education and Learning Development - Dissertation

Name of Learner:	<b>Suzanne Burdis</b>
Name of Supervisor:	<b>Lloyd Scott</b>
Date:	May, June, July 2023
Meeting #	Confirmed via email
Progress (including material submitted):  May: Confirmed the artefact is complete and submitted internally within the employer organisation. Awaiting feedback for further refining of the artefact. Dissertation by practice report writing to begin as soon as possible.  June: Concerns expressed by employer about sharing employer document (artefact) with external client. MAELD Programme Director, Dissertation Co-ordinator and Supervisor informed.  July: Awaiting instruction for work-around on the confidentiality issue raised.	
Things to do by next meeting:  Continue working on the report	
Agreed time, date, and mode of next meeting:  Submit work to supervisor as it is ready.	
Signed (by learner):  	
Signed (by supervisor):	

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**NB: Learners to complete the progress report after every meeting/discussion and email to supervisor for signing within 24 hours of meeting/discussion.**

### Appendix 3: Ethical Approval

#### Part 3: Griffith College Ethical Approval Form

This form should be completed by the researcher (with the advice of the research supervisor), for all research which involves human participants.

<b>Research Title</b>	
<b>Researcher(s)/Learner</b>	Suzanne Burdis
<b>Supervisor (where relevant)</b>	Lloyd Scott
<b>Programme of Study (where relevant)</b>	MAELD

#### Part (a)

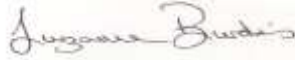
		Yes	No	N/A
1	Will you describe the main research procedures to participants?	X		
2	Will you tell participants that their participation is voluntary?	X		
3	Will you obtain written consent for participation?	X		
4	If the research is observational, will you ask participants for their consent to being observed?			X
5	Is the right to freely withdraw from the research at any time made explicit to participants?	X		
6	Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs?	X		
7	Will you debrief participants at the end of their participation?	X		
8	Will your research involve discussion of topics which the participants might find sensitive?		X	
9	Will financial inducements (other than reasonable expenses or compensation for time) be offered to participants?		X	
10	Will your project involve deliberately misleading participants in any way?		X	
11	Is there any realistic risk of any participants experiencing either physical or psychological distress or discomfort?		X	
12	Does your research involve participants who are particularly vulnerable or who may feel unable to give informed consent e.g., prisoners; children; people for whom English is not their first language; learners in a programme you teach on?		X	
13	Will any non-anonymised and/personalised data be generated and/stored?		X	

#### Part (b)

For each question 8 to 13 that you answered YES, please give a summary of the issue and action to be taken to address it (no more than 300 words in total): N/A

Potential other ethical issues:

**Signed (by Researcher):**



**Date:**

**To be completed by the supervisor (in the case of a learner application)**

PLEASE TICK ONE

As the supervisor of this research project, I confirm that I believe that all ethical issues relating to research have been dealt with in accordance with the College's policy on research ethics.

The application requires the attention and approval of the Research Ethics Committee. (In general, forms which answer 'yes' to questions 8-13, should be forwarded to the Research Ethics Committee).

Comments:

**Signed (Supervisor):**

**Date:**

## Appendix 4: Dissertation Submission Cover Sheet



# Griffith College

### Assessment Cover Sheet

Student Name:	Suzanne Burdis-Murphy Suzanne.burdis@griffith.ie
Student Number:	2805528
Faculty:	Teaching & Learning
Programme:	MAELD
Module:	Dissertation
Lecturer Name:	Peter Gilis
Dissertation Title	Rapid MMC up/re-skilling of the construction workforce: a collaborative approach through the use of micro-credentials
Supervisor:	Lloyd Scott
Word Count:	8,177 words From introduction to conclusion (including references and quotations)
Due Date:	16 <sup>th</sup> July 2023
Date Submitted:	19 <sup>th</sup> July 2023
Pick tick as appropriate:	On time <input type="checkbox"/> Extension Approved <input checked="" type="checkbox"/> Deferred <input type="checkbox"/> Repeat <input type="checkbox"/>

Please note all students must retain a hard/soft copy of all assignments and must sign the

Academic Misconduct:

*I confirm that I have submitted the assignment through Turnitin, and I understand that I will be subject to the penalties imposed for breaches of academic conduct such as plagiarism as defined in the College's Academic Misconduct Procedure (QA J6)*

Signature:



Date: 18<sup>th</sup> July 2023

Assessment Cover sheet provided as proof of submission.

## **Appendix 5: Request for Restriction of Access**

In exceptional circumstances, learners may be permitted to restrict access to their work, for a year at a time, up to a maximum of five years. This will require the authorisation of the Research Committee.

### **Application for restriction of access**

I require access to my dissertation on Griffith College's institutional repository, Griffith Open, to be restricted for one year from the date below.

I understand that, at the end of this period, I may request Griffith College Library to extend the restriction for a further year, and then annually, up to a maximum of five years, after which restricted access will no longer apply.

It is my responsibility to notify Griffith Library if I require an extension, and the Library is under no obligation to contact me regarding the extension of the restriction.

### **Please state the reason for requesting restricted access:**

The artefact, which is the subject of this report, is a new programme document and the QQI documentation includes private and confidential information about the author's employer. The author does not have permission from the employer to include this information in this dissertation by practice report.

Signature of Supervisor

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Date:

---

Suzanne Burdis-Murphy  
Dissertation by Practice Report  
Signature of student:



---

Date: 18<sup>th</sup> July 2023

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**Appendix 6: Stakeholders in the programme and collaboration**

The private education provider: The private education provider is responsible for the design of the proposed programme, successful delivery of the programme, and assessment of the programme learning outcomes. The education provider has to consider the capacity and capabilities to deliver and assess this micro-credential programme, including the knowledge, skills, and expertise of lecturing and tutoring staff. Additionally, the education provider considers the physical and virtual classroom facilities required, best locations for the live elements of delivery, including campus’ in Dublin, Cork and Limerick, administration supports including programme director, registration, examination supports and quality assurance and enhancement requirements. IT supports, library facilities, student services supports are also considered.

Construction Industry Federation (CIF): CIF, through CPSkillnet, awarded the tender for the proposed programme to the private education provider, and partners with the education provider in this venture. This programme will be exclusively for CIF members, initially. If successful, the programme could potentially be marketed to the wider construction industry in Ireland and beyond.

Target learners: The target learners for the programme are CIF members, located nationwide. These target learners are SME business owner/ managers in organisations along the construction value chain in Ireland. These individuals hold senior positions in their organisations, are academically and/ or professionally qualified, and/ or have many years' industry experience. Learners will have to meet the minimum entry requirements as per QQI and the private education providers’ policies and procedure.

Construction Professional Skillnet (CPSkillnet): CPSkillnet are financiers of the programme, through government funding. They will have to meet government-imposed terms and conditions regarding the design, validation, and initial and subsequent running of the programme. CPSkillnet will impose contractual terms and conditions on the private education provider, in line with government and CPSkillnet requirements. CPSkillnet will be responsible for the selling and marketing of the programme to CIF members and will sponsor each learner on the programme.

Quality and Qualifications Ireland (QQI): QQI are the regulatory body responsible for the approval and validation of the programme and the private education provider will follow and comply with QQI regulations in the design, panel approval and subsequent validation and delivery of the programme. The programme aims, learning outcomes, content, delivery, and assessment strategy must be designed and justified by reference to evidence-based demand for the programme; learner, industry and representative bodies' needs; sound pedagogy and an enjoyable and rewarding learning experience. Significant documentation is required to be submitted to QQI for approval of the proposed programme, in addition to the approval of the programme by a panel of academics and industry experts.

.....

## **Appendix 7: Focus Group attendees**

The following industry representatives were consulted in the development of this programme, through focus group discussions (March 7<sup>th</sup> and 27<sup>th</sup> 2023), follow-up interviews (February through to April 27<sup>th</sup>, 2023), and a review of a draft proposal programme document:

- Kathleen Fanning – independent focus group chair and facilitator
- Liz Carroll – CPSkillnet
- Sean Downey - Director, Construction Industry Federation
- Claire Lane – (formerly of) LMC
- Denise Tuffy – CIF
- Martin Searson – CJK Engineering
- James Duncan – BRE Walford
- Joe Friel – ATU
- James Clifford – Cogent Associates
- Derbhla McDonagh – O’Mahony Pike
- Juan Morillas – SISK
- Cillian Kelly – SISK
- Lee Murphy – G-Frame Structure Ltd

## Appendix 8: Sample survey for learners

The lecturer always connects on time for online classes Score 1 to 5	The lecturer outlines the purpose of each class effectively Score 1 to 5	The lecturer is always well prepared Score 1 to 5	The lecturer uses online teaching materials effectively Score 1 to 5	The lecturer presents new terms, concepts, and principles clearly Score 1 to 5	The lecturer is approachable and responsive when contacted through email, Moodle message or Zoom chat Score 1 to 5
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If you have any specific comments to make about this module, please write them in the box below.

Overall, would you recommend this lecturer?  
Please comment

How would you improve the delivery of this module?

## **Appendix 9: Sample interview questions for lecturers**

These sample interview questions were delivered informally, in person, and kept open-ended to allow the flow of conversation to be determined by the interviewee and directed as they deemed fit and relevant.

General questions:

1. Name of module
2. Were the physical and technical resources appropriate and sufficient to meet your teaching, learning and assessment strategies and provide a good learning experience?

Questions about the module:

3. Are the module learning outcomes appropriate for level 8 and target learners
4. Is the module content up-to-date and relevant

Questions about the teaching, learning and assessment strategies:

5. Describe the learner engagement on the programme
6. What elements of your teaching methods were well received, what might you change or not do again
7. Learners undertook a work-related assessment; describe the learner engagement in this assessment, including identifying any opportunities for learners to showcase their project with their employer, the college, their peers
8. Learners expressed a desire for more technical information on MMC and more guest speakers; can you envisage where you can meet these demands in your module?
9. In your view, what are the graduate attributes on completion of this micro-credential programme, and do they meet the intended programme learning outcomes?



**Griffith College**

**Coláiste Uí Ghríofa**

**Learner Handbook**

**Certificate in Strategic Supply Management  
for Modern Methods of Construction (MMC)**



1.1.1 Module Title
Strategic Supply Management for Modern Methods of Construction
1.1.2 Minimum Intended Module Learning Outcomes (MIMLOs)
<p><b>Module aims and objectives</b></p> <p>This module introduces and develops the key concepts in Modern Methods of Construction (MMC) and strategic supply management. It is primarily concerned with the changing construction and supply chain ecosystems requirements for MMC and the direct impact on strategic supply management. The module examines procurement and supply chain models/frameworks and explores the possible roadmaps and best choice points for a construction business to establish and maintain effective and efficient MMC supply chains. The module presents models, concepts and solutions that are important for the design, control, operation, and management of supply chains in MMC. The learner develops an appreciation of how MMC will shape and affect decisions for the operation and sustainable growth of a construction or related organisation and build competitive advantage through strategic supply management.</p> <p><b>Minimum intended module learning outcomes</b></p> <p>On successful completion of this module, learners are able to:</p> <ul style="list-style-type: none"> <li>(i) Identify the concepts, practices and frameworks that apply to Modern Methods of Construction</li> <li>(ii) Examine the direct impact of MMC on procurement and supply chain drivers to achieve organisational goals</li> <li>(iii) Analyse the enablers of procurement and supply chain management for the adoption of MMC</li> <li>(iv) Appraise the key issues and concepts in developing a procurement and supply chain strategy in planning for a MMC project</li> <li>(v) Appraise the value of information and communication in MMC supply chain networks</li> <li>(vi) Discuss the principles of building a sustainable procurement and supply management system</li> </ul>
1.1.3 Module Content
<p><b>Module content, organisation, and structure</b></p> <p>This module consists of the following key sections, each of which consists of a number of sub sections:</p> <p><b>Modern Methods of Construction – Context (20%)</b></p> <ul style="list-style-type: none"> <li>• Traditional construction process versus MMC as a business model</li> <li>• Design Intent/Design Flexibility/ Design Freeze</li> <li>• The current status of MMC in Ireland and the legislative context</li> <li>• Contracting for MMC</li> <li>• Importance of information and use of technology in MMC</li> <li>• Project SWOT Analysis – To enable the decision of Traditional versus MMC route</li> </ul> <p><b>Introduction to Supply Chain Management (10%)</b></p> <ul style="list-style-type: none"> <li>• Supply chains for MMC</li> <li>• Supply chain strategy and planning activities</li> <li>• Customer service and centricity – setting the specification for the supply chain</li> <li>• Moving from silos to a co-ordinated network or web – the supply chain is only as strong as its weakest link</li> <li>• Managing the information, financial and material flows</li> <li>• Creating a win-win relationship</li> <li>• Tiers and systems integrators for MMC</li> </ul> <p><b>Supply Management and MMC enablers (15%)</b></p> <ul style="list-style-type: none"> <li>• Strategic Supply Management for competitive advantage</li> <li>• Demand and supply management – connecting the value chain</li> <li>• Risk management and resilience along the MMC value chain</li> </ul>

- Knowledge management and teamwork
- Change management and collaboration
- Communication for success

**Strategic Procurement and Supply Decisions for MMC - Client Delivery (30%)**

- Client communication and engagement
- Nature of logistics outputs (products and services)
- Product and service characteristics and cost implications
- Determining optimum service levels
  - Cost – benefit analysis of MMC
    - Life Cycle Cost
    - Circular Economy
    - Cost of Transport
    - Cost of Factory Inspections
    - Carbon count
    - Calculate Pre-Manufactured Value (PMV)
  - Procurement and Risk Management in the context of MMC
    - Regulatory and CE Marking
    - Certified and Tested Products
    - Material Innovation
    - Supplier eco-system
    - Knowledge sharing and feedback loop
    - Early stakeholder and supply chain engagement
    - Project specifications and tolerances
    - Sustainability through the procurement cycle
    - Professional Indemnity and identifying who is responsible for what and when
    - Vesting certificates
    - Risk-sharing approach

**Procurement and Supply Chain Organisation and Control (10%)**

- Organisational choices (i.e., Procurement routes such as: Design & Build, Early Contractor Involvement (ECI), Collaborative frameworks, Public Works framework agreements (performance-based specification applied), Alliance agreements, Joint Ventures, Front-loaded Cashflow models, etc. that support MMC)
- Supply chain control and control systems

**Purchasing and Scheduling in MMC (15%)**

- Forecasting methods, inventory management problems
- Pull and push inventory methods
- Inventory management applied to MMC
- Just-in-time supply scheduling
- Purchasing and sourcing
- Coordination in supply channel
- Transport and logistics
- Aligning procurement schedule with project delivery

**1.1.4 Teaching and learning (including formative assessment) strategy**

The module will be delivered through the use of the following:

- Enquiry Based Learning (EBL); participants deepen their knowledge and understanding of the key issues surrounding MMC. With EBL, scenarios or case studies are presented at the outset of class sessions to stimulate curiosity and to ascertain the participants' knowledge of the topic.

<p>EBL helps participants to probe deeper into the subject as knowledge is acquired through shared peer experiences of real world MMC related problems.</p> <ul style="list-style-type: none"> <li>Recorded and live lectures – PowerPoint presentations.</li> <li>MMC Industry expert guest speakers will present examples detailing actual MMC events, throughout the module delivery, linking learning concepts to real life situations.</li> <li>Role play.</li> <li>Individual and group problem solving, facilitating peer and self-assessment, allows participants to test their understanding of the role of procurement and supply chain management in the context of MMC and their ability to deal with problems that arise.</li> <li>End of learning summary and conclusions. Every learning session ends with a concise, but thorough, summary of the important ideas.</li> </ul>
---

#### 1.1.5 Summative assessment strategy

In designing the assessment, the teaching team focuses on encouraging enquiry, research and advancing knowledge across the module content with specific application to an industry project relevant to the learner.

No.	Description	MIMLOs	Weighting
1	<p><b>Industry project</b></p> <p>The learner undertakes a supervised written report on a Modern Methods of Construction project (current or proposed) in their own/ related workplace, incorporating the learning from this module.</p> <p>If a learner is not exposed to MMC within their own workplace environment, they may conduct primary/secondary research on an MMC project, as agreed with the supervisor. Alternatively, a case study will be provided to facilitate the learner completing the assessment.</p>	(i) to (vi)	100%

**Reassessment/Repeat assessment strategy:** Griffith College regulations state that learners must pass all component elements of the module to be deemed to have passed the module. In the event of a learner failing the assessment for this module, they will be required to submit a new individual repeat assignment which will be made available on Moodle to learners, and which must be submitted as per faculty instructions.

#### 1.1.6 Reading Lists and other information sources

The following texts are recommended for this module:

**Strategic Supply Management:**

Christopher, P.M. (2016) *Logistics & Supply Chain Management*. 5<sup>th</sup> edition. Harlow, England: New York: FT Publishing International

Chopra, S. (2018) *Supply Chain Management: Strategy, Planning, and Operation*. 7<sup>th</sup> edition. New York, NY: Pearson

Harrison, A. (2019) *Logistics Management and Strategy 5th Edition: Competing through the Supply Chain*. 6<sup>th</sup> edition. Harlow, England; New York: Pearson

Kilubi, I. (2018) *Strategic Technology Partnering and Supply Chain Risk Management, Five Selected Essays*, Springer Gabler.

Lysons, D.K. and Farrington, D.B. (2016) *Procurement and Supply Chain Management*. 9<sup>th</sup> edition. Boston: Pearson

Rushton, A., Croucher, P. and Baker, D.P. (2017) *The Handbook of Logistics and Distribution Management: Understanding the Supply Chain*. 6<sup>th</sup> edition. London, United Kingdom: Kogan Page.

Sindi, S. and Roe, M. (2017) *Strategic Supply Chain Management, The Development of a Diagnostic Model*, Palgrave Macmillan.

Simchi-Levi, D., Kaminsky, P. and Simchi-Levi, E. (2019) *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies*. 4<sup>th</sup> edition. Boston: McGraw-Hill Education.

Trent, R. (2018) *Strategic Supply Management Revisited*. J. Ross Publishing.

Wheelen, T.L., Hunger, J.D., Hoffman, A.N. and Bamford, C.E. (2018) *Concepts in Strategic Management and Business Policy: Globalization, Innovation and Sustainability*, 15th Edition, Pearson.

Harvard Business Review – selected articles

**Modern Methods of Construction:**

Akerlof (November 2020) *Modern Methods of Construction: A Perspective on the UK Market*. Enterprise Ireland.

Bertram, N., Fuchs, S., Mischke, J., Palter, R., Strube, G. and Woetzel, J. (2019). *Modular construction: From projects to products*. Zurich, Switzerland: McKinsey & Company [online] Available at:  
<https://www.mckinsey.com/~media/mckinsey/business%20functions/operations/our%20insights/modular%20construction%20from%20projects%20to%20products%20new/modular-construction-from-projects-to-products-full-report-new.pdf>

CIF (December 2020) *Modern Methods of Construction: A Quantitative Analysis of the Irish Engineering & Construction Sector Market for CSG – Subgroup on Innovation and Digital Adoption*.

CIF (December 2021) *Modern Methods of Construction: A Qualitative Analysis of the Irish Engineering & Construction Sector Market, including 'one-to-one' MMC Stakeholder interviews for CSG – Subgroup on Innovation and Digital Adoption*.

Constructing Excellence, UK - Supply Chain Management guide (2015). Available at:

Ref: <https://constructingexcellence.org.uk/wp-content/uploads/2015/03/supplychain.pdf>

Construction Professionals Skillnet (2022); *Modern Methods of Construction: Defining MMC Business*; Available at: <https://www.skillnetireland.ie/wp-content/uploads/2022/05/Modern-Methods-of-Construction-Defining-MMC-Business.pdf>

Department of Business, Enterprise, and Innovation (2020) *Ireland's Industry 4.0 Strategy 2020-2025: Supporting the digital transformation of the manufacturing sector and its supply chain. Rialtas na hÉireann: Government of Ireland (as a reference point to MMC skills)*

Ernst & Young (2020) *Technological advancements disrupting the global construction industry report*. Ernst and Young LLP.

McKinsey Report, June 2019 titled: "*Modular construction: From projects to products*."

Available at: <https://www.mckinsey.com/capabilities/operations/our-insights/modular-construction-from-projects-to-products>

McKinsey & Company (2020) "*The next normal in construction: How disruption is reshaping the world's largest ecosystem*." Available at: <https://www.mckinsey.com/capabilities/operations/our-insights/the-next-normal-in-construction-how-disruption-is-reshaping-the-worlds-largest-ecosystem>

MEED; (2021); "*Repeatability shapes the future of Middle East construction*", Available at: <https://www.meed.com/repeatable-success>

Nadim, W., and Goulding, J.S. (2010) *Off-site Production: a model for building down barriers: A European construction industry perspective*. School of Built and Natural Environment, University of Central Lancashire, Preston, UK.

Reddy, L.N. (2020) *Barriers and Opportunities in adopting and implementing Off-site Construction (OFC) in Irish Construction Industry*. Waterford Institute of Technology (WIT), <https://www.researchgate.net/publication/351035324>

Shibani A., Agha, A., Hassan, D., Al-Hadeethi, Y. and Choudhury, M. (May 2021) *Effectiveness of the Modern Methods of Construction in Terms of Cost and Time: A Case Study of the United Kingdom* (Journal of Civil Engineering Research) [online] Available at: [https://www.researchgate.net/publication/351591994\\_Effectiveness\\_of\\_the\\_Modern\\_Methods\\_of\\_Construction\\_in\\_Terms\\_of\\_Cost\\_and\\_Time\\_A\\_Case\\_Study\\_of\\_the\\_United\\_Kingdom](https://www.researchgate.net/publication/351591994_Effectiveness_of_the_Modern_Methods_of_Construction_in_Terms_of_Cost_and_Time_A_Case_Study_of_the_United_Kingdom)



Griffith College

Coláiste Uí Ghríofa

## Assessment Handbook

**Certificate in Strategic Supply Management  
for Modern Methods of Construction (MMC)**



**Business School Assignment Title Sheet**

<b>Programme:</b>	Certificate in Strategic Supply Management for Modern Methods of Construction		
<b>Supervisor Name:</b>	TBA		
<b>Study Mode:</b>	Full time		Part-time <b>Yes</b>
<b>Assignment Title</b>	<b>Industry Project</b>		
<b>Word count:</b>	3,000 - 3,500 words	<b>% Weighting</b>	100%
<b>Due date(s):</b>	TBA		
<b>Submit assignment to:</b>	Turnitin link on programme Moodle page		
<b>Programme Learning Outcomes Assessed:</b>	<ul style="list-style-type: none"> <li>(i) Identify the concepts, practices and frameworks that apply to Modern Methods of Construction</li> <li>(ii) Examine the direct impact of MMC on procurement and supply chain drivers to achieve organisational goals</li> <li>(iii) Analyse the enablers of procurement and supply chain management for the adoption of MMC</li> <li>(iv) Appraise the key issues and concepts in developing a procurement and supply chain strategy in planning for a MMC project</li> <li>(v) Appraise the value of information and communication in MMC supply chain networks</li> <li>(vi) Discuss the principles of building a sustainable procurement and supply management system</li> </ul>		
<b>Presentation:</b>	<p><b>Text:</b> Times New Roman, Font Size 12, 1.5 Spacing, Justified text</p> <p><b>Headings:</b> Times New Roman, Font Size 14, Bold</p> <p>Work submitted must be the students <b>OWN</b> work</p>		

**Assignment Information:**

**Introduction**

The capstone assessment for this programme is a research report, 3,000 - 3,500 words. The learner must investigate and report on the importance of strategic supply management to a Modern Methods of Construction project that the learner or their company has been involved in/intends to undertake, or that the learner has researched using primary/secondary research. The report should analyse procurement and supply chain models/frameworks and perform an evaluation of the best choice points for the organisation to establish and maintain effective and efficient MMC supply chains. The report should end with appropriate recommendations for future practice

In writing this report, the learner should incorporate the learning from the module on this programme.

If the learner is not exposed to MMC within their own workplace environment, they may conduct primary/secondary research on an MMC project, as agreed with their supervisor. Alternatively, a case study will be provided. The topic should be discussed and agreed with the supervisor. The topic chosen and the approach taken to this research project must be appropriate in scale and complexity to the programme (as a special purpose 10 ECTS level 8 award).

To support learners in the research of the chosen/allocated MMC project, the learner must nominate (or be assigned) a MMC industry expert, to advise and mentor them throughout this project.

This is an authentic assessment of a 'real life' scenario, providing the learner with a tangible output from the programme, to bring back to their workplace. Each learner is required to work independently, under supervision, with the aim of investigating and reporting on a Modern Methods of Construction scenario, and the relevance of strategic procurement and supply chain management to that scenario. The learner must include appropriate references to industry and educational literature and policies in the research and report on the chosen scenario.

**Ethical Clearance**

Ethics and confidentiality, including issues regarding intellectual property (IP) is a significant consideration in this project. As part of the research process, learners are required to complete an Ethical Clearance Form which incorporates a Plain Language statement together with an Informed Consent Form. All learners and supervisors must ensure that this section is successfully completed prior to the commencement of the research. The research cannot be commenced without this approval.

If a learner has any ethical queries/ concerns, they should advise their supervisor at the earliest opportunity.

**Assignment Brief:**

You are required to write an investigative report on the importance of strategic supply management to a Modern Methods of Construction project that you or your company has been involved in/intends to undertake, or that you have researched using primary/secondary research. The report should analyse procurement and supply chain models/frameworks and perform an evaluation of the best choice points for the chosen organisation to establish and maintain an effective and efficient MMC supply chain. The report should conclude with appropriate recommendations for future practice

**Research and Writing in Higher Education skills preparation:**

In advance of undertaking the research project, you are required to attend research and writing skills information and support sessions. The learning outcomes for these sessions are as follows:

- (i) Plan and structure writing effectively
- (ii) Use academic language appropriately and effectively in written work
- (iii) Manage intellectual property and other ethical considerations in research
- (iv) Research and Harvard Style Referencing

**Session content will include:**

***Written Communication:***

- *Structuring an assignment*
- *Using titles, outlines, and topic development strategies effectively when planning and writing*
- *Providing a clear introduction and conclusion*

***Research:***

- *Types of research.*
  - *Primary research*
  - *Secondary research*
- *Academic writing and referencing*
- *Ethics and other issues in research*
- *Discussion of proposed project topics with peer feedback*

***Recommended reading:***

*Cottrell, S. (2017) Critical Thinking Skills: Effective Analysis, Argument and Reflection. Basingstoke: Palgrave*

*Gray, D.E. (2017) Doing Research in the Real World. London: SAGE Publications Ltd*

*Saunders, M.N.K., Lewis, P. and Thornhill, A. (2018) Research Methods for Business Students. New York: Pearson.*

**The following marking scheme will be applied in the assessment of learner's project work**

Criteria Descriptors	Introduction	Strategic Supply Management in MMC	Discussion & Recommendations	Presentation of Research Report
	Definition of research project & study outline. Rationale for choice of project and the research methods used.	Analysis of procurement and supply chain models/frameworks and the evaluation of the best choice points for the specific construction business to establish and maintain effective and efficient MMC supply chains.	Quality of discussion, analysis of findings, conclusions, and recommendations for future practice	Presentation, including layout and structuring of material (conformity to conventional format of a report of practice), neatness, style, and clarity. Appropriate & professional presentation of original work. Correct referencing using Harvard Referencing Style.
<b>Criteria weighting [of total 100 marks]</b>	<b>10</b>	<b>55</b>	<b>25</b>	<b>10</b>
<b>A+ (80-100)</b>	An outstanding introduction and rationale for the project	An outstanding, detailed and carefully supported analysis and evaluation of the best choice points for the specific construction business to establish and maintain an effective and efficient MMC supply chain. Exceptional and wide-ranging sources provided	Work of considerable quality, demonstrating extensive knowledge of best practice in the field, meticulous analysis, persuasive argument(s), and expert skill. Exceptional ability to relate theory and concepts to the project Recommendations are very practicable.	Exceptionally well structured and presented, conforming to requirements. Appropriate & professional presentation of original work correctly referenced using the Harvard Referencing System. Exceptional and wide-ranging sources provided
<b>A (70-79)</b>	A very good, structured introduction and rationale for the project.	A very good, detailed and carefully supported analysis and evaluation of the best choice points for the specific construction business to establish and maintain an effective and efficient MMC supply chain.  Very good and wide-ranging sources provided	Work of very good quality, demonstrating a very good knowledge of current work and best practice in the field, with evidence of a depth of analysis and breadth of viewpoint reaching conclusions of perceptive insight.  Very good ability to relate theory and concepts to the project. Most of the recommendations are very practicable.	Very well structured and presented, conforming to requirements. Appropriate & professional presentation of original work correctly referenced using the Harvard Referencing System.  Very good and wide-ranging sources provided
<b>B (60-69)</b>	A good, structured introduction and rationale for the project	A good, detailed and carefully supported analysis and evaluation of the best choice points for the specific construction business to establish and maintain an effective and efficient MMC supply chain. Strong evidence of	Work of good quality, demonstrating a good knowledge of current work and best practice in the field, with evidence of analysis and breadth of insightful viewpoints. Good	Well-structured and presented, conforming to requirements. Appropriate & professional presentation of original work correctly referenced using the Harvard Referencing

Criteria Descriptors	Introduction	Strategic Supply Management in MMC	Discussion & Recommendations	Presentation of Research Report
		relevant research of suitable sources and a good range of sources.	ability to relate theory and concepts to the project. Some of the recommendations are practicable.	System. Good and wide-ranging sources provided
<b>C (50-59)</b>	An adequately structured introduction and rationale for the project	A good, supported analysis of the best choice points for the specific construction business to establish and maintain an effective and efficient MMC supply chain. Provides demonstration of relevant research sources as well as a range of sources.	Work of very adequate quality, demonstrating adequate knowledge of current work and best practice in the field, with evidence of a depth of analysis and breadth of viewpoint reaching adequate conclusions. Theoretical principles/ concepts are included but underdeveloped. Many of the recommendations are somewhat practicable.	Reasonably structured and presented, conforming to requirements. Document is readable and clear for the most part. Appropriate presentation of original work correctly referenced using the Harvard Referencing System. Good but limited sources provided
<b>D (40-49)</b>	A somewhat adequately structured introduction and rationale for the project. Brief in content.	An insufficient but adequate analysis of the best choice points for the specific construction business to establish and maintain an effective and efficient MMC supply chain. Some relevant research conducted but only a limited range of sources.	Work of adequate quality, demonstrating adequate knowledge of current work and best practice in the field, with evidence of some analysis and breadth of viewpoint reaching adequate conclusions. Theoretical principles/ concepts are underdeveloped. Recommendations are somewhat practicable.	Somewhat reasonably structured and presented, generally conforming to requirements. Readable and clear for the most part. Appropriate presentation of original work correctly referenced using the Harvard Referencing System. Adequate but limited sources provided
<b>E (35-39)</b>	A barely adequately structured introduction and rationale for the project	Insufficient account of the best choice points for the specific construction business to establish and maintain an effective and efficient MMC supply chain. Minimal use of sources	Work shows evidence of inadequate knowledge, breadth and understanding of the current field and best practice. Essential concepts are not adequately understood. Difficulty relating theoretical principles to the project. Recommendations are not adequate and/or practical.	Merely adequate document. Difficult to read and follow, somewhat unclear. Not always correctly referenced using the Harvard Referencing System. Limited sources provided

Suzanne Burdis-Murphy  
 Dissertation by Practice Report

Criteria Descriptors	Introduction	Strategic Supply Management in MMC	Discussion & Recommendations	Presentation of Research Report
F (<35)	Signs of serious confusion and misunderstanding Not of a passing standard.	Signs of serious confusion and misunderstanding Not of a passing standard.	Signs of serious confusion and misunderstanding Not of a passing standard.	Signs of serious confusion and misunderstanding Not of a passing standard.

## **Appendix 11: Post Panel Informal Programme Feedback & Proposed Responses**

This document has been provided by the external panel of academic, MMC and procurement and supply chain experts, who reviewed this programme and recommended it for QQI validation. At the time of writing the formal panel report has not been received. This document contains brief, informal feedback on the programme for the programme team to consider, in advance of the receipt of the formal panel report.

**Programme:** Certificate in Supply Management for MMC Level 8

**The programme is recommended for validation**

### **Special Conditions**

None

### **Commendations**

1. The panel commends the quality of the documentation submitted by the programme team.
2. The panel commends the presentation of the module content which was provided in very clear well-defined units which will be of benefit to the learners.
3. The panel commends the development of a timely professional development opportunity for those operating in the construction industry to upskill and re-skill to engage with and/or manage an MMC supply chain effectively, through strategic supply management, while meeting organisational objectives.
4. The panel commends the student focussed approach evident in the programme, in particular the resources and support structures in place.

### **Recommendations**

1. The panel recommends that the programme team considers the wider opportunities for graduates of this programme beyond housing, e.g., related to schools, hospitals, and data centres etc.  
*Proposed response: The Programme Descriptor for Micro-Credential document, section 1.2 Rationale for the programme, identifies the need for such projects based on the predicted population growth in Ireland and particularly Dublin. This is additionally addressed in the module content 'Current status of MMC in Ireland'. A MMC expert has been engaged to deliver this element of the module. This expert has worked on many construction projects using MMC, including airport terminals and hospitals. MMC guest experts will also present case studies to the learners, and these experts come from manufacturing, supply chain and legal backgrounds, and have been involved in many different MMC projects*
2. The panel recommends that the programme team includes in the module content considerations of various challenges related contractual solutions; recognising that it is not a one size fits all approach.

Proposed response: *This is addressed in the module content already as follows:*

- *Traditional construction process versus MMC as a business model*
  - *The current status of MMC in Ireland and the legislative context*
  - *Contracting for MMC – **The team can include risks and challenges here***
  - *Project SWOT Analysis – To enable the decision of Traditional versus MMC route*
3. The panel recommends that the programme team reviews the programme content to sequentially define and separate strategic procurement from operational deliverables.  
Proposed response: *The module content section will be updated according to this recommendation. The author has contacted the procurement and supply chain lecturing expert, who reviewed the module content pre-panel, for assistance with this matter.*
4. The panel recommends that as part of the delivery of the module that they link with some suitable / varied supply chain companies to show how their businesses work from an operational, strategic, and manufacturing perspective e.g., video / presentation by experts of a factory and how their operating model in MMC works.  
Proposed response: *The owner/ manager of a manufacturing company, member of CIF based in the west of Ireland, has been contracted to present a case study on off-site manufacturing to the learners. This person has also offered an on-site tour of the organisation's manufacturing plant, if wished. This will be provided to the learners if there is sufficient demand. This was already a feature of the pilot programme and was intended to be replicated in the proposed programme.*
5. The panel recommends that guests/experts invited to participate in module delivery come from a wide spectrum of the MMC supply chain, e.g., volumetric housing, M&E companies, and panelised companies etc.  
Proposed response: *MMC expert guest speakers from manufacturing, supply chain, construction, project management and legal backgrounds have already been contracted to present. The author in her capacity as programme director, in conjunction with CPSkillnet will endeavour to engage more experts and ensure the complete construction value chain is represented. Section 1.1.4 of the module descriptor document 'Teaching and learning (including formative assessment) strategy', includes a reference to MMC expert guest lecturers, this will be amended as follows:*
- 'MMC, **manufacturing and procurement and supply chain** expert guest speakers will present examples detailing actual MMC projects, throughout the module delivery, linking learning concepts to real life situations.

**Appendix 12: Image: Minister for Further and Higher Education, Research Innovation and Science launches pilot programme.**



Image courtesy of Griffith College; 13<sup>th</sup> February 2023 Minister for Further and Higher Education, Research Innovation and Science, Simon Harris, launches pilot programme.

**Griffith College social media press release:**

**Minister Harris launches new Programme in Modern Methods of Construction**

Griffith College and Skillnet Ireland have collaborated on the launch of a new programme in Modern Methods of Construction. The development of these critical skillsets are at the core of government plans to meet the needs for the Housing For All, Project Ireland 2040 and the National Development Plan.

The programme has been developed with the demands of the workforce in mind, recent industry surveys by the Construction Professionals Skillnet have found that 54% of companies using MMC do not believe the skills needed are currently being met in Ireland.

The launch took place in Government Buildings alongside Simon Harris TD, Minister for Further and Higher Education, Research, Innovation and Science.

Commenting on the launch Minister Harris said, *“Modern Methods of Construction is a key component in helping the construction industry meet Government’s ambitious targets for housing, as well as the broader commercial requirements of our economy. The development of this new programme will greatly boost Ireland’s Modern Methods of Construction capability and support the delivery of both the National Development Plan and Housing for All strategy.”*