



QQI

Quality and Qualifications Ireland
Dearbhú Cáilíochta agus Cáilíochtaí Éireann

Independent Evaluation Report on an Application for Validation of a Programme of Education and Training

Part 1. Provider details

Provider name	CCT College Dublin
Date of site visit	29 Jul 2020
Date of report	

Section A. Overall recommendations

Principal programme	Title	Higher Diploma in Science in Artificial Intelligence Concepts and Applications
	Award	
	Credit	60
	Recommendation <i>Satisfactory OR Satisfactory subject to proposed conditions OR Not Satisfactory</i>	Satisfactory subject to proposed conditions

Embedded programme 1	Title	
	Award	
	Credit	
	Recommendation <i>Satisfactory OR Satisfactory subject to proposed conditions OR Not Satisfactory</i>	

Section B. Expert Panel

Name	Role	Affiliation
Mr. David Denieffe	Chair	Registrar, Institute of Technology Carlow
Prof. Martin McKinney	Subject Matter Expert	Professor Emeritus of Computing, Ulster University
Dr. Donna O'Shea	Subject Matter Expert	Chair of Cybersecurity & Acting Head of Department of Computer Science CIT
Mr. Niall Larkin	Subject Matter Expert	Accelerator Programmes Leader NDRC (Digital Hub)
Dr. Catherine Peck	Secretary	Education Consultant
Ms. Teena Choudhary	Learner Representative	University of Limerick

Section C. Principal Programme

Names of centre(s) where the programme(s) is to be provided	Maximum number of learners (FT)	Maximum number of learners (PT)
CCT Campus Dublin	120	80

Proposed Duration and Enrolment					
	First Intake Date	Duration	Intakes per Annum	Enrolment i.e. learners per Intake	
			Maximum	Minimum	Maximum
Full-Time	01 Sep 2020	2 semesters	2	8	60
Part-Time	01 Sep 2020	3 semesters	2	8	40
Intake Schedule e.g. January September					

Panel Commentary on proposed enrolment:

With regard to proposed enrolment, the Panel has identified a recommendation for CCT. This is that CCT should continue its practice of keeping full-time and part-time cohorts separate in the virtual environment. However, CCT might consider how efficiencies could be maximised with regard to different cohorts from different programmes with shared modules availing of the same asynchronous, pre-recorded lecture content. The semester 1 and 3 schedules could also be reviewed to optimise and coordinate deliveries.

Brief synopsis of the programme (e.g. who it is for, what is it for, what is involved for learners, what it leads to.)

The Higher Diploma in science in Artificial Intelligence Concepts and Applications (60 ECTS) is designed for domestic and international learners seeking to develop their knowledge, skills and competence in the area of Artificial Intelligence. This targeted programme is designed to produce graduates with the attributes required of an A.I. Developer today, and with the ability to continue

to develop knowledge, skill and competence to remain competitive and employable in a rapidly changing and expanding sector of the economy.

Learners will be provided with the opportunity to assimilate knowledge within an industry focused learning environment. This focus is maintained through the use of practical sessions in labs and workshops supported by on campus and online interactive learning. Graduates will be qualified to assume entry level industry roles and/or to further advance their education.

Target learner groups

The programme is aimed at full time, part time, domestic and international learners. All applicants must have qualifications or experience which evidences discipline specific expertise to level 8 (or level 7 with experience), including mathematical proficiency, to a minimum of NFQ level 7 or equivalent. This programme is designed to include learners in a related industry and those seeking employment within this field. It is also for those aspiring to progress their academic experience to a Level 8 NFQ award, specifically in the area of Artificial Intelligence. The programme is aimed at those learners who have already attained a Level 7 or 8 NFQ major award in a cognate discipline and are seeking to fine tune their knowledge of their chosen field with a specialist themed course of study.

Approved countries for provision

Ireland

Delivery mode: Full-time/Part-time

Full time & Part time including blended learning

The teaching and learning modalities

Lecture, Webinar, lab (physical and virtual), tutorial, workshop, group work.

Summary of specifications for teaching staff

Role	Profile	WTE
Academic and Professional:	MSc required. However NFQ Level 8 in Computer Science, Software Development, Software Engineering or equivalent is acceptable in cases where significant industrial experience is evident. Industry experience will be essential for those who do not have a postgraduate award.	2
Software Development and Associated Experience:	A minimum of 1 year experience required, 3 years of experience preferred.	2
Pedagogical:	Teaching experience is desired including experience of blended learning programmes. Completion of postgraduate CPD/Certificate in Teaching and Learning or similar preferred. Where experience in blended learning is not present, training and support will be provided.	2

Learning Activity	Ratio of learners to teaching staff
Laboratory work / Tutorials (inc. online)/ Workshops	1:25
Lectures / Demonstrations /webinars	1:50

Panel Commentary on programme outline and staffing:

With regard to staffing, the Panel is generally satisfied that CCT has appropriate processes in place for the recruitment and management of appropriately qualified academic staff, and that the minimum specifications listed are appropriate for the programme outlined.

The Panel has identified one relevant condition of validation for CCT. This is that the programme document must contain information pertaining to the appropriate provision of technical support for learners outside of class contact hours, and that the allocation of human or physical resources to ensure this must be specified in the programme document.

Programmes being replaced (applicable to applications for revalidation)		
Code	Title	Last enrolment date
N/A	N/A	N/A

Section D. Other noteworthy features of the application

Not Applicable

Part 1A Evaluation of the Case for an Extension of the Approved Scope of Provision (where applicable).

Having examined appropriate QA / Governance procedures, comment on the case for extending the applicant's Approved Scope of Provision to enable provision of this programme. (Especially relevant for move to online delivery / assessment)

Not Applicable

Part 2. Evaluation against the validation criteria

Criterion 1. The provider is eligible to apply for validation of the programme

<p>a) The provider meets the prerequisites (section 44(7) of the 2012 Act) to apply for validation of the programme.</p> <p>b) The application for validation is signed by the provider’s chief executive (or equivalent) who confirms that the information provided is truthful and that all the applicable criteria have been addressed.</p> <p>c) The provider has declared that their programme complies with applicable statutory, regulatory and professional body requirements.¹</p>		
Programme	Satisfactory? (yes, no, partially)	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Yes	<p>The Panel is satisfied that the provider is eligible to apply for validation of the programme</p> <p>CCT has complied with section 44(7) of the 2012 Act. Specifically, CCT has had its procedures for quality assurance (QA) approved by QQI. The provider has submitted procedures for access, transfer and progression, which are discussed under Criterion 4 in this report.</p> <p>A provider authorisation/declaration accompanying the application for validation has been signed by the College President. This declaration verifies the accuracy of the information provided, as well as providing an assurance that resources are in place to deliver the programme. The declaration further states that the proposed programme complies with applicable statutory, regulatory and professional body requirements.</p>

¹This criterion is to ensure the programme can actually be provided and will not be halted on account of breach of the law. The declaration is sought to ensure this is not overlooked but QQI is not responsible for verifying this declaration of enforcing such requirements.

Criterion 2. The programme objectives and outcomes are clear and consistent with the QQI awards sought

<ul style="list-style-type: none"> a) The programme aims and objectives are expressed plainly. b) A QQI award is specified for those who complete the programme. <ul style="list-style-type: none"> (i) Where applicable, a QQI award is specified for each embedded programme. c) There is a satisfactory rationale for the choice of QQI award(s). d) The award title(s) is consistent with unit 3.1 of QQI's <i>Policy and Criteria for Making Awards</i>. e) The award title(s) is otherwise legitimate for example it must comply with applicable statutory, regulatory and professional body requirements. f) The programme title and any embedded programme titles are <ul style="list-style-type: none"> (i) Consistent with the title of the QQI award sought. (ii) Clear, accurate, succinct and fit for the purpose of informing prospective learners and other stakeholders. g) For each programme and embedded programme <ul style="list-style-type: none"> (i) The minimum intended programme learning outcomes and any other educational or training objectives of the programme are explicitly specified.² (ii) The minimum intended programme learning outcomes to qualify for the QQI award sought are consistent with the relevant QQI awards standards. h) Where applicable, the minimum intended module learning outcomes are explicitly specified for each of the programme's modules. i) Any QQI minor awards sought for those who complete the modules are specified, where applicable. <p>For each minor award specified, the minimum intended module learning outcomes to qualify for the award are consistent with relevant QQI minor awards standards.³</p>

Programme	Satisfactory? (yes, no, partially)	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Partially	<p>The Panel is partially satisfied that provider's application meets this criterion.</p> <p>The Panel was of the view that the programme's aims and objectives were expressed plainly. However the Panel held concerns regarding the alignment of the minimum intended module learning outcomes (MIMLOs) to the minimum intended programme learning outcomes (MIPLOs), and the extent to which some of the MIMLOs were appropriate to achievement of an NFQ Level 8 award. The Panel has recommended special conditions of validation pertaining to this.</p> <p>With regard to the programme title, the Panel has identified a recommendation. This is that CCT should consider shortening the programme title to Higher Diploma in Science in Artificial Intelligence Applications.</p>

² Other programme objectives, for example, may be to meet the educational or training requirements of a statutory, regulatory or professional body.

³ Not all modules will warrant minor awards. Minor awards feature strongly in the QQI common awards system however further education and training awards may be made outside this system.

Criterion 3. The programme concept, implementation strategy, and its interpretation of QQI awards standards are well informed and soundly based (considering social, cultural, educational, professional and employment objectives)

- a) The development of the programme and the intended programme learning outcomes has sought out and taken into account the views of stakeholders such as learners, graduates, teachers, lecturers, education and training institutions, employers, statutory bodies, regulatory bodies, the international scientific and academic communities, professional bodies and equivalent associations, trades unions, and social and community representatives.⁴
- b) The interpretation of awards standards has been adequately informed and researched; considering the programme aims and objectives and minimum intended programme (and, where applicable, modular) learning outcomes.
 - (i) There is a satisfactory rationale for providing the programme.
 - (ii) The proposed programme compares favourably with existing related (comparable) programmes in Ireland and beyond. Comparators should be as close as it is possible to find.
 - (iii) There is support for the introduction of the programme (such as from employers, or professional, regulatory or statutory bodies).
 - (iv) There is evidence⁵ of learner demand for the programme.
 - (v) There is evidence of employment opportunities for graduates where relevant⁶.
 - (vi) The programme meets genuine education and training needs.⁷
- c) There are mechanisms to keep the programme updated in consultation with internal and external stakeholders.
- d) Employers and practitioners in the cases of vocational and professional awards have been systematically involved in the programme design where the programme is vocationally or professionally oriented.
- e) The programme satisfies any validation-related criteria attaching to the applicable awards standards and QQI awards specifications.

Programme	Satisfactory? (yes, no, partially)	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Partially	<p>The Panel is partially satisfied that provider’s application meets this criterion.</p> <p>CCT’s programme development process is outlined in Section 3.3 of its documentation. This includes reference to consultation with industry, faculty and staff. Section 3.4 identifies the target learners as graduates of IT or cognate disciplines aspiring to progress their academic experience of a Level 8 NFQ award in the area of Artificial Intelligence.</p> <p>The Panel was not satisfied that the programme documentation was appropriately explicit in</p>

⁴ Awards standards however detailed rely on various communities for their interpretation. This consultation is necessary if the programme is to enable learners to achieve the standard in its fullest sense.

⁵ This might be predictive or indirect.

⁶ It is essential to involve employers in the programme development and review process when the programme is vocationally or professionally oriented.

⁷ There is clear evidence that the programme meets the **target learners’** education and training needs and that there is a clear demand for the programme.

		<p>relation to graduate outcomes. For example, in Section 3.4 the programme document states: “<i>This targeted programme is designed to produce graduates with the attributes required of an Artificial Intelligence developer</i>”. The Panel was of the view that the graduate profile for the programme needed to be more clearly specified, and to identify particular roles graduates would be qualified to fulfil. The Panel has identified a recommended special condition of validation for CCT pertaining to this.</p> <p>Further, the Panel was not satisfied that CCT’s application reflected significant engagement between the programme team and industry during the development phase. The Panel acknowledges a number of letters indicating high level support for the programme from employers, which were provided to the Panel on the day of the virtual site visit. However, both the letters and the overall consultation process with industry and employers outlined by CCT’s representatives were broad in focus. The Panel was of the view that the application therefore did not reflect a meaningful contribution by employers or practitioners to the development of the programme rationale or the design of the programme curriculum. The Panel has identified a recommendation for CCT pertaining to this, to ensure the systematic involvement of employers in programme design is effectively presented in future submissions for validation.</p>
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Criterion 4. The programme's access, transfer and progression arrangements are satisfactory

<p>a) The information about the programme as well as its procedures for access, transfer and progression are consistent with the procedures described in QQI's policy and criteria for access, transfer and progression in relation to learners for providers of further and higher education and training. Each of its programme-specific criteria is individually and explicitly satisfied⁸.</p> <p>b) Programme information for learners is provided in plain language. This details what the programme expects of learners and what learners can expect of the programme and that there are procedures to ensure its availability in a range of accessible formats.</p> <p>c) If the programme leads to a higher education and training award and its duration is designed for native English speakers, then the level of proficiency in English language must be greater or equal to B2+ in the Common European Framework of Reference for Languages (CEFR⁹) in order to enable learners to reach the required standard for the QQI award.</p> <p>d) The programme specifies the learning (knowledge, skill and competence) that target learners are expected to have achieved before they are enrolled in the programme and any other assumptions about enrolled learners (programme participants).</p> <p>e) The programme includes suitable procedures and criteria for the recognition of prior learning for the purposes of access and, where appropriate, for advanced entry to the programme and for exemptions.</p> <p>f) The programme title (the title used to refer to the programme):-</p> <ul style="list-style-type: none"> (i) Reflects the core <i>intended programme learning outcomes</i>, and is consistent with the standards and purposes of the QQI awards to which it leads, the award title(s) and their class(es). (ii) Is learner focused and meaningful to the learners; (iii) Has long-lasting significance. <p>g) The programme title is otherwise legitimate; for example, it must comply with applicable statutory, regulatory and professional body requirements.</p>		
Programme	Satisfactory? (yes, no, partially)	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Partially	<p>The Panel is partially satisfied that provider's application meets this criterion.</p> <p>CCT has provided information about the programme and procedures for access, transfer and progression that are consistent with QQI's policy in this area. However, the Panel has identified a recommended special condition of validation pertaining to the precise knowledge, skills and competences that learners were expected to have achieved before enrolment</p>

⁸ Each of the detailed criteria set out in the Policy and criteria for access, transfer and progression in relation to learners for providers of further and higher education and training must be addressed in the provider's evaluation report. The detailed criteria are (QQI, restated 2015) arranged under the headings

- Progression and transfer routes
- Entry arrangements
- Information provision

⁹ http://www.coe.int/t/dg4/linguistic/Source/Framework_EN.pdf (accessed 26/09/2015)

		<p>and the programme specific procedures for recognition of prior learning.</p> <p>Section 4.2.2 of the programme document outlines that direct entry requires applicants to evidence discipline specific expertise, including mathematical proficiency, to a minimum of NFQ Level 7. Specifically, learners are required to have an NFQ Level 8 degree in a cognate discipline to ICT or an NFQ Level 7 degree in a non-cognate discipline in addition to “post qualification discipline-relevant work experience”. The Panel was of the view that CCT needed to specify within the application what level of mathematical competence would be required of applicants, and include a list of suitable and applicable cognate disciplines for the programme.</p> <p>The programme document notes that RPL applications will be considered in accordance with the institutional RPL Policy. However, as discussions during the virtual site visit indicated that RPL applications would be dealt with on a case by case basis, the Panel was of the view that the process for this should also be outlined within the application.</p>
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- The entry requirements and the detailed RPL procedures for applicants that do not meet these and will be dealt with on a case by case basis. If it is a graduate conversion programme then it should specify exactly what disciplines are relevant in terms of conversion. It should also detail the procedure for applicants that do not meet the entry requirements and how they will be considered on a case by case basis, referring them to their RPL policy etc. The list of suitable and applicable cognate disciplines must be clearly identified.
- The profile of target learners. As a graduate conversion programme, this profile must include the list of suitable and applicable cognate disciplines for the programme.

The entry requirements, including any specific prerequisite skills (e.g. mathematical competence) required to undertake the programme.

- The RPL procedures for applicants that do not meet the entry requirements and who will be dealt with on a case by case basis.

Criterion 5. The programme’s written curriculum is well structured and fit-for-purpose

- a) The programme is suitably structured and coherently oriented towards the achievement by learners of its intended programme learning outcomes. The programme (including any stages and modules) is integrated in all its dimensions.
- b) In so far as it is feasible the programme provides choice to enrolled learners so that they may align their learning opportunities towards their individual educational and training needs.
- c) Each module and stage is suitably structured and coherently oriented towards the achievement by learners of the intended *programme* learning outcomes.
- d) The objectives and purposes of each of the programme’s elements are clear to learners and to the provider’s staff.
- e) The programme is structured and scheduled realistically based on sound educational and training principles¹⁰.
- f) The curriculum is comprehensively and systematically documented.
- g) The credit allocated to the programme is consistent with the difference between the entry standard and minimum intended programme learning outcomes.
- h) The credit allocated to each module is consistent with the difference between the module entry standard and minimum intended module learning outcomes.
- i) Elements such as practice placement and work-based phases are provided with the same rigour and attentiveness as other elements.
- j) The programme **duration** (expressed in terms of time from initial enrolment to completion) and its **fulltime equivalent contact time** (expressed in hours) are consistent with the difference between the minimum entry standard and award standard and with the credit allocation.¹¹

Programme	Satisfactory?	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	No	<p>The Panel is not satisfied that the provider’s application meets this criterion.</p> <p>The Panel noted overall deficiencies in the module documentation that needed to be addressed. These pertained to the nature, articulation and overall alignment of the MIMLOs, the module specific teaching, learning and assessment strategies and the presentation of reading lists. The Panel identified recommended special conditions of validation pertaining to these issues.</p> <p>The Panel held concerns regarding the alignment of the written curriculum to the MIPLOs. The Panel noted, for example, that the written curriculum presented did not provide evidence that learners would be able to achieve, for example, the following outcomes:</p>

¹⁰ This applies recursively to each and every element of the programme from enrolment through to completion.

In the case of a modular programme, the pool of modules and learning pathway constraints (such as any prerequisite and co-requisite modules) is explicit and appropriate to the intended programme learning outcomes.

¹¹ If the duration is variable, for example, when advanced entry is available, this should be explained and justified

		<ul style="list-style-type: none"> • maintain secure, scalable solutions for a variety of challenging cognitive systems problems, suitable for many implementation, deployment and migration routes, while evaluating the limitations of these technologies, costs and benefits of both design and implementation choices (PLO 1) • engage in complex planning, design, technical functions/implement, troubleshoot and analyse existing legacy solutions/incorporating advanced theoretical knowledge, practical skill and specialised tools and techniques (PLO 4) • implement and test machine learning models (PLO 5) <p>The Panel noted that within the documentation presented, there appeared to be an inadequate treatment of underpinning database material (including DBMS and SQL). It held concerns that without this, learners would find the current module “Analytical Methods for Big Data” very difficult.</p> <p>The Panel also felt consideration needed to be given to the inclusion of a focus on basic statistics (potentially within the module Machine Learning for Artificial Intelligence) to enable learners to interpret the data or results properly.</p> <p>The Panel has identified an overall recommendation for CCT pertaining to consolidating some of the modules presented for the programme with modules from another programme concurrently presented for validation (Higher Diploma in Science in Data Analytics for Business).</p> <p>Notes on Individual Modules</p> <p>Module 2: The Panel queried the intended nature of this module and observed that if, as advised it was one that combined theory with supporting technical work, the MIMLOs should be written to more clearly reflect this. The Panel noted that indicative content within this module did not appear to map accurately to the MIMLOs, and that some terminology used within the MIMLOs was unclear (e.g. MIMLO 2 ‘different agents’ and MIMLO 3 ‘different levels of AI’.</p> <p>Module 3: The Panel queried whether MIMLO 2 was more appropriate to Module 2, and noted that MIMLO 3 was overly generic and not reflective of the module title in that visualisation techniques were not covered within the module. The Panel was of the view that this was an important module as it provided learners with basic programming skills important to graduates converting into the field. However, the verbs used in the MIMLOs were not reflective of NFQ Level 8 outcomes.</p>
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		Module 4: The Panel queried why the module was not simply titled Machine Learning, and felt that the MIMLOs could more effectively reflect the technical tone of the indicative content.
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Criterion 6. There are sufficient qualified and capable programme staff available to implement the programme as planned

<p>a) The specification of the programme’s staffing requirements (staff required as part of the programme and intrinsic to it) is precise, and rigorous and consistent with the programme and its defined purpose. The specifications include professional and educational qualifications, licences-to practise where applicable, experience and the staff/learner ratio requirements. See also criterion 12 c).</p> <p>b) The programme has an identified complement of staff¹² (or potential staff) who are available, qualified and capable to provide the specified programme in the context of their existing commitments.</p> <p>c) The programme's complement of staff (or potential staff) (those who support learning including any employer-based personnel) are demonstrated to be competent to enable learners to achieve the intended programme learning outcomes and to assess learners’ achievements as required.</p> <p>d) There are arrangements for the performance of the programme’s staff to be managed to ensure continuing capability to fulfil their roles and there are staff development¹³ opportunities¹⁴.</p> <p>e) There are arrangements for programme staff performance to be reviewed and there are mechanisms for encouraging development and for addressing underperformance.</p> <p>f) Where the programme is to be provided by staff not already in post there are arrangements to ensure that the programme will not enrol learners unless a complement of staff meeting the specifications is in post.</p>		
Programme	Satisfactory? (yes, no, partially)	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Yes	<p>The Panel is satisfied that the provider’s application meets this criterion.</p> <p>Programme staffing requirements are specified within the programme documentation. As CCT has a history of delivering programmes in the domain, a complement of appropriately qualified staff with discipline specific expertise are already in place at the centre to facilitate delivery of the proposed programme.</p> <p>Discussions during the site visit indicated that CCT staff were supported in their roles through Continuing Professional Development (CPD) opportunities offered by the provider.</p>

¹² Staff here means natural persons required as part of the programme and accountable (directly or indirectly) to the programme’s provider, it may for example, include contracted trainers and workplace supervisors.

¹³ Development here is for the purpose of ensuring staff remain up-to-date on the discipline itself, on teaching methods or on other relevant skills or knowledge, to the extent that this is necessary to ensure an adequate standard of teaching.

¹⁴ Professional or vocational education and training requires that teaching staff’s professional/vocation knowledge is up to date. Being qualified in a discipline does not necessarily mean that a person is currently competent in that discipline. Therefore, performance management and development of professional and vocational staff needs to focus on professional/vocational competence as well as pedagogical competence. Professional development may include placement in industry, for example. In regulated professions it would be expected that there are a suitable number of registered practitioners involved.

Criterion 7. There are sufficient physical resources to implement the programme as planned

- a) The specification of the programme’s physical resource requirements (physical resources required as part of the programme and intrinsic to it) is precise, and rigorous and consistent with the programme, its defined purpose and its resource/learner-ratio requirements. See also criterion 12 d).
- b) The programme has an identified complement of supported physical resources (or potential supported physical resources) that are available in the context of existing commitments on these e.g. availability of:
 - (i) suitable premises and accommodation for the learning and human needs (comfort, safety, health, wellbeing) of learners (this applies to all of the programme’s learning environments including the workplace learning environment)
 - (ii) suitable information technology and resources (including educational technology and any virtual learning environments provided)
 - (iii) printed and electronic material (including software) for teaching, learning and assessment
 - (iv) suitable specialist equipment (e.g. kitchen, laboratory, workshop, studio) – if applicable
 - (v) technical support
 - (vi) administrative support
 - (vii) company placements/internships – if applicable
- c) If versions of the programme are provided in parallel at more than one location each independently meets the location-sensitive validation criteria for each location (for example staffing, resources and the learning environment).
- d) There is a five-year plan for the programme. It should address
 - (i) Planned intake (first five years) and
 - (ii) The total costs and income over the five years based on the planned intake.
- e) The programme includes controls to ensure entitlement to use the property (including intellectual property, premises, materials and equipment) required.

Programme	Satisfactory? (yes, no, partially)	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Partially	<p>The Panel is partially satisfied that provider’s application meets this criterion.</p> <p>CCT operates from owned premises in Dublin with capacity to facilitate the projected number of learner enrolments. However, given that the programme is proposed for delivery in blended learning mode, the Panel were of the view that resources specific to this aspect of the application needed to be clearly identified in the application.</p> <p>Section 4.2.2 of the programme document specifies that applicants will be required to have access to the internet and a laptop or desktop PC with a minimum recommended specification of Windows OS with a minimum RAM Memory of 8GB DDR4 RAM and a basic processor Intel i3 (7th Gen and above) and a dedicated graphics card. CCT states that this specification will be published to potential learners and kept under review over the life of the programme.</p>

		<p>Following discussions with the provider during the virtual site visit, the Panel has identified a recommended special condition of validation. This is that the programme documents specify the human and physical resources allocated by CCT to ensure the provision of technical support for staff and learners, including support outside of class contact hours. The programme document should also include further details pertaining to the appropriate access to software, hardware and facilities required by both staff and learners working in the online environment.</p>
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Criterion 8. The learning environment is consistent with the needs of the programme’s learners

<p>a) The programme’s physical, social, cultural and intellectual environment (recognising that the environment may, for example, be partly virtual or involve the workplace) including resources and support systems are consistent with the intended programme learning outcomes.</p> <p>b) Learners can interact with, and are supported by, others in the programme’s learning environments including peer learners, teachers, and where applicable supervisors, practitioners and mentors.</p> <p>c) The programme includes arrangements to ensure that the parts of the programme that occur in the workplace are subject to the same rigours as any other part of the programme while having regard to the different nature of the workplace.</p>		
Programme	Satisfactory? (yes, no, partially)	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Yes	<p>The Panel is satisfied that the provider’s application meets this criterion.</p> <p>CCT is a well-established provider with a strong culture of learner-centeredness. The College has a stated commitment to the development of learners’ transversal skills and to facilitating a supportive environment conducive to social learning.</p> <p>There are no work placements within the proposed programme.</p>

Criterion 9. There are sound teaching and learning strategies

<p>a) The teaching strategies support achievement of the intended programme/module learning outcomes.</p> <p>b) The programme provides authentic learning opportunities to enable learners to achieve the intended programme learning outcomes.</p> <p>c) The programme enables enrolled learners to attain (if reasonably diligent) the minimum intended programme learning outcomes reliably and efficiently (in terms of overall learner effort and a reasonably balanced workload).</p> <p>d) Learning is monitored/supervised.</p> <p>e) Individualised guidance, support and timely formative feedback is regularly provided to enrolled learners as they progress within the programme.</p>		
Programme	Satisfactory? (yes, no, partially)	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Partially	<p>The Panel is partially satisfied that the provider’s application meets this criterion.</p> <p>The Panel held concerns that the Programme’s Teaching and Learning (including Formative Assessment Strategy documentation was highly generic, and did not sufficiently reflect explicit consideration of how the blended delivery mode would impact practice in this area. Within the module documentation, learning and teaching strategies were also generic and not specific to the module itself.</p> <p>During the virtual site visit, CCT representatives outlined that within modules up to 10 hours on campus learning would be typical, using a flipped classroom approach that drew upon provision of asynchronous learning materials. Synchronous online teaching sessions would be dynamic, and include elements of co-teaching. Student engagement in online learning is closely monitored, and acts as a flag within the College’s broader retention strategy.</p> <p>The Panel has identified recommended special conditions of validation pertaining to this criterion. These require CCT to ensure the documented strategies are programme and module specific, and clearly indicative of how achievement of the intended programme and module learning outcomes will be achieved.</p>

Criterion 10. There are sound assessment strategies

<p>a) All assessment is undertaken consistently with <i>Assessment Guidelines, Conventions and Protocols for Programmes Leading to QQI Awards</i>¹⁵</p> <p>b) The programme’s assessment procedures interface effectively with the provider’s QQI approved quality assurance procedures.</p> <p>c) The programme includes specific procedures that are fair and consistent for the assessment of enrolled learners to ensure the minimum intended programme/module learning outcomes are acquired by all who successfully complete the programme.¹⁶</p> <p>d) The programme includes formative assessment to support learning.</p> <p>e) There is a satisfactory written programme assessment strategy for the programme as a whole and there are satisfactory module assessment strategies for any of its constituent modules.¹⁷</p> <p>f) Sample assessment instruments, tasks, marking schemes and related evidence have been provided for each award-stage assessment and indicate that the assessment is likely to be valid and reliable.</p> <p>g) There are sound procedures for the moderation of summative assessment results.</p> <p>h) The provider only puts forward an enrolled learner for certification for a particular award for which a programme has been validated if they have been specifically assessed against the standard for that award.</p>		
Programme	Satisfactory ? (yes, no, partially)	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Partially	<p>The Panel is partially satisfied that the provider’s application meets this criterion.</p> <p>The Panel held concerns that the overall assessment strategy presented within the programme document was insufficiently detailed. Further, the module documentation did not make clear how module assessments were aligned to (and would demonstrate achievement of) the MIMLOs. Reassessment strategies were not clearly represented. Therefore, the Panel were unable to make an adequate evaluation of the assessment strategy in terms of how appropriate sample assessment instruments were or how suitable the overall assessment schedule was.</p> <p>During the virtual site visit, CCT representatives discussed the integrated approach to assessment planned for the programme with the Panel. Discussion also explored how academic integrity was supported at CCT and what processes were in place at the College to prevent and detect plagiarism. Following these discussions, the Panel identified recommended special conditions of validation and a further recommendation for CCT pertaining to this criterion.</p>

¹⁵ See the section on transitional arrangements.

¹⁶ This assumes the minimum intended programme/module learning outcomes are consistent with the applicable awards standards.

¹⁷ The programme assessment strategy is addressed in the Assessment Guidelines, Conventions and Protocols for Programmes Leading to QQI Awards. See the section on transitional arrangements.

Criterion 11. Learners enrolled on the programme are well informed, guided and cared for

- a) There are arrangements to ensure that each enrolled learner is fully informed in a timely manner about the programme including the schedule of activities and assessments.
- b) Information is provided about learner supports that are available to learners enrolled on the programme.
- c) Specific information is provided to learners enrolled on the programme about any programme-specific appeals and complaints procedures.
- d) If the programme is modular, it includes arrangements for the provision of effective guidance services for learners on the selection of appropriate learning pathways.
- e) The programme takes into account and accommodates to the differences between enrolled learners, for example, in terms of their prior learning, maturity, and capabilities.
- f) There are arrangements to ensure that learners enrolled on the programme are supervised and individualised support and due care is targeted at those who need it.
- g) The programme provides supports for enrolled learners who have special education and training needs.
- h) The programme makes reasonable accommodations for learners with disabilities¹⁸.
- i) If the programme aims to enrol international students it complies with the *Code of Practice for Provision of Programmes to International Students*¹⁹ and there are appropriate in-service supports in areas such as English language, learning skills, information technology skills and such like, to address the particular needs of international learners and enable such learners to successfully participate in the programme.
- j) The programme's learners will be well cared for and safe while participating in the programme, (e.g. while at the provider's premises or those of any collaborators involved in provision, the programme's locations of provision including any workplace locations or practice-placement locations).

Programme	Satisfactory?	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Partially	<p>The Panel is partially satisfied that the provider's application meets this criterion.</p> <p>CCT is a well-established provider, and offers a range of supports for learners. The College appointed a Student Success Lead in 2019, and has retention and early warning strategies implemented across its programmes. Students have access to group study spaces, and benefit from library services. These include a range of online and on campus classes in areas including academic integrity, academic writing, exam preparation and dissertation planning. Information about these and other services is communicated to learners via meetings, college publications, student notices and within lectures. Reasonable accommodations are made for learners with disabilities, and there is a positive disposition within CCT toward facilitating a diverse and inclusive</p>

¹⁸ For more information on making reasonable accommodations see www.AHEAD.ie and QQI's Policies, Actions and Procedures for Access, Transfer and Progression for Learners (QQI, restated 2015).

¹⁹ See Code of Practice for Provision of Programmes to International Students (QQI, 2015)

		<p>learning environment. A careers service as well as academic support and counselling is also available.</p> <p>However, the Panel notes that it has identified recommended special conditions of validation that require CCT to provide more information on aspects of this criterion within the programme document. These pertain to the guidance and support mechanisms that will allow prospective learners to make an informed choice of programme, the blended delivery mode, and the allocation of resources for technical support and infrastructure requirements.</p>
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Criterion 12. The programme is well managed

<p>a) The programme includes intrinsic governance, quality assurance, learner assessment, and access, transfer and progression procedures that functionally interface with the provider’s general or institutional procedures.</p> <p>b) The programme interfaces effectively with the provider’s QQI approved quality assurance procedures. Any proposed incremental changes to the provider’s QA procedures required by the programme or programme-specific QA procedures have been developed having regard to QQI’s statutory QA guidelines. If the QA procedures allow the provider to approve the centres within the provider that may provide the programme, the procedures and criteria for this should be fit-for-purpose of identifying which centres are suited to provide the programme and which are not.</p> <p>c) There are explicit and suitable programme-specific criteria for selecting persons who meet the programme’s staffing requirements and can be added to the programme’s complement of staff.</p> <p>d) There are explicit and suitable programme-specific criteria for selecting physical resources that meet the programmes physical resource requirements, and can be added to the programme’s complement of supported physical resources.</p> <p>e) Quality assurance²⁰ is intrinsic to the programme’s maintenance arrangements and addresses all aspects highlighted by the validation criteria.</p> <p>f) The programme-specific quality assurance arrangements are consistent with QQI’s statutory QA guidelines and use continually monitored completion rates and other sources of information that may provide insight into the quality and standards achieved.</p> <p>g) The programme operation and management arrangements are coherently documented and suitable.</p> <p>h) There are sound procedures for interface with QQI certification.</p>		
Programme	Satisfactory?	Comment
Higher Diploma in Science in Artificial Intelligence Concepts and Applications	Yes	The Panel is satisfied that the provider’s application meets this criterion. CCT has established corporate governance and central quality assurance procedures in place, and successfully reengaged with QQI for approval of its QA in 2018. The management and procedures outlined for the proposed programme fully comprehend the provider’s QA procedures.

²⁰ See also QQI’s Policy on Monitoring (QQI, 2014)

Part 3. Overall recommendation to QQI

3.1 Principal programme: Higher Diploma in Science in Artificial Intelligence Concepts and Applications

Select one	
	Satisfactory (meaning that it recommends that QQI can be satisfied in the context of unit 2.3) of Core policies and criteria for the validation by QQI of programmes of education and training;
X	Satisfactory subject to proposed special conditions (specified with timescale for compliance for each condition; these may include proposed pre-validation conditions i.e. proposed (minor) things to be done to a programme that almost fully meets the validation criteria before QQI makes a determination);
	Not satisfactory.

Reasons for the overall recommendation

The Panel is of the view that there are a number of areas to be addressed by CCT prior to implementation of the programme. These are discussed under Criterion 1 – 12 in this report and identified in the sections below.

Summary of recommended special conditions of validation

1. CCT must revise the presentation of the programme concept within the documentation to more clearly identify:
 - The profile of target learners. As a graduate conversion programme, this profile must include the list of suitable and applicable cognate disciplines for the programme.
 - The entry requirements, including any specific prerequisite skills (e.g. mathematical competence) required to undertake the programme.
 - The RPL procedures for applicants that do not meet the entry requirements and who will be dealt with on a case by case basis.
 - The employment opportunities for graduates (role specific).
 - The guidance and other support mechanisms that will allow prospective learners to make an informed choice of programme.
2. CCT must undertake a focused review of the written curriculum proposed for the programme, taking account of the Panel's commentary pertaining to specific modules (provided under Criterion 5 in this report).
3. CCT must review the programme document module descriptors to ensure that:
 - Reading lists contain up to date reference material, use a consistent referencing style and include ISBN numbers.

- The module teaching and learning (including formative assessment) strategy is specific to the module.
 - The module reassessment strategy is clearly indicated.
 - All Minimum Intended Module Learning Outcomes (MIMLOs):
 - Are measurable (i.e. exclude terms such as 'understand' or 'appreciate');
 - Are appropriate to NFQ Level 8;
 - Define the nature of learning within the module (i.e. theoretical, practical or both), using appropriate verbs;
 - Are consistent with the indicative module content;
 - Map clearly to the Minimum Intended Programme Learning Outcomes (MIPLOs);
 - Map clearly to the module assessment strategy.
4. CCT must revise the Programme Teaching and Learning (including Formative Assessment) strategy presented in the programme document. The strategy should be specific to the programme, and include:
- Clear information about the blend of delivery modes to be employed, and the pedagogic rationale for employing this particular blend in the programme.
 - The corresponding necessary infrastructure requirements (i.e. minimum specifications for laptops or computers, internet access, etc.).
5. CCT must indicate within the programme documents what specific human and physical resources have been allocated to ensure:
- The appropriate provision of technical support for staff and learners in the online environment. Within this, clear information about the nature of available support for learners outside of class contact hours must be provided.
 - The appropriate access to software, hardware/facilities required by staff and learners working in the online environment.
6. CCT must further develop its assessment strategy for the programme to ensure that the Panel can adequately evaluate its appropriateness, including the level of vulnerability associated with the integrated assessment strategy. Within this:
- As per Validation Criterion 17.10 (f), sample assessment instruments, tasks, marking schemes and related evidence need to be provided to the Panel to indicate that the assessment is likely to be valid and reliable.
 - Appendix 8 must be reviewed to clearly indicate that Semester 3 is scheduled in the subsequent academic year for learners enrolled part-time. Standard terminology must be used to indicate assessment types in this document.

Summary of recommendations to the provider

1. The Panel recommends that CCT consider shortening the programme title to Higher Diploma in Science in Artificial Intelligence Applications.

2. The Panel recommends that CCT consider consolidating modules presented with modules from the programme concurrently presented for validation (Higher Diploma in Science in Data Analytics for Business).
3. The Panel recommends that CCT continue its practice of keeping full-time and part-time cohorts separate in the virtual environment. However, CCT might consider how efficiencies could be maximised with regard to different cohorts from different programmes with shared modules availing of the same asynchronous, pre-recorded lecture content. The semester 1 and 3 schedules could also be reviewed to optimise and coordinate deliveries.
4. The Panel recommends that CCT formalise its processes for documenting how employers are systematically involved in programme design, and its presentation of this involvement within programme documents in future submissions.
5. The Panel recommends that CCT consider use of MOSS as a measure to safeguard against software plagiarism.
6. The Panel recommends that CCT consider reorienting case studies or applications currently focused on gaming to areas where significantly more employment opportunities will be available to graduates in Ireland, for example in the area of smart manufacturing.

Part 4. Overall recommendation to QQI

4.1 Principal programme: Higher Diploma in Science in Artificial Intelligence Concepts and Applications

Select one	
	Satisfactory (meaning that it recommends that QQI can be satisfied in the context of unit 2.3) of Core policies and criteria for the validation by QQI of programmes of education and training;
X	Satisfactory subject to proposed special conditions (specified with timescale for compliance for each condition; these may include proposed pre-validation conditions i.e. proposed (minor) things to be done to a programme that almost fully meets the validation criteria before QQI makes a determination);
	Not satisfactory.

Reasons for the overall recommendation

The Panel reconvened on August 31st to review evidence submitted by CCT that the initial recommended special conditions of validation had been met, and to make an overall recommendation for the programme. The Panel was of the view that although substantive work had been done to improve the programme, some discrete issues remained. These are identified in Sections 4.1.1 and 4.1.2 below.

4.1.1 Summary of recommended special conditions of validation

1. The Panel note that with regard to reassessment strategies, the following text within module documentation does not provide the Panel with sufficient clarity regarding what is proposed or how it will be managed: *“Learners who fail the integrated assessment will be required to repeat the failed element(s) of the assessment and submit at the reassessment point”*. This must be revised with a view to ensuring the intended strategy is transparent for the purpose of external evaluation prior to delivery of the programme.
2. The Panel note that with regard to access (minimum requirements for general learning) the programme documentation states that learners must demonstrate an NFQ Level 8 or equivalent level of numerate, technical **or** analytical competence. The Panel is of the view that as this is a conversion programme, this must be worded and interpreted as numerate, technical **and** analytical competence at NFQ Level 8. This must be addressed prior to delivery of the programme.
3. The Panel note that there is a deficiency of documented evidence that, in the development of the programme, CCT has systematically involved employers in the process of programme design or sought out and taken into account the view of employers and industry bodies. The Panel notes that this activity should be used to inform the identification of employment opportunities for graduates. Therefore, the panel requires CCT to develop a process for formalising stakeholder involvement in programme development and review within a period of six months. This process must be developed with a view to facilitating transparency during processes including programme validation, programmatic review and programme revalidation. The panel has made a detailed recommendation for CCT regarding how this could be achieved.

4.1.2 Summary of recommendations to the provider

1. The Panel recommend that CCT consider establishing an Industry Advisory Council representing stakeholders in industry that would be drawn from variety of related sectors and that would cover a number of their programmes. The Industry Advisory Council could usefully:
 - establish a calendar of quarterly meetings
 - work off a defined agenda to:
 - have industry representatives present briefly on new topics impacting industry,
 - have programmes teams present briefly on learnings, new developments, future plans
 - elicit and capture feedback and input from the Council on current course/industry fit
 - use qualitative data captured to inform plans and anticipate emerging needs as appropriate
 - record minutes, actions arising and impact on programme design, delivery and development.
2. The Panel recommend that CCT review the presentation of the programme documentation to ensure the learning hours per semester are clearly presented and address any apparent imbalance.
3. The Panel recommend that at future validation and revalidation events CCT place emphasis on demonstrating preparedness for Validation Criterion 17.10 (f) which requires that sample assessment instruments, tasks, marking schemes and related evidence need to be provided to indicate that the assessment is likely to be valid and reliable.

Declarations of Evaluators' Interests

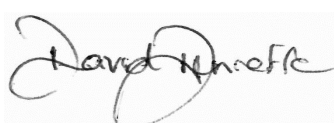
No Interests have been declared

This report has been agreed by the evaluation Panel and is signed on their behalf by the chairperson.

Panel chairperson: David Denieffe

Date: 7th October 2020

Signed:



4.2 Disclaimer

The Report of the External Review Panel contains no assurances, warranties or representations express or implied, regarding the aforesaid issues, or any other issues outside the Terms of Reference.

While QQI has endeavoured to ensure that the information contained in the Report is correct, complete and up-to-date, any reliance placed on such information is strictly at the reader's own risk, and in no event will QQI be liable for any loss or damage (including without limitation, indirect or consequential loss or damage) arising from, or in connection with, the use of the information contained in the Report of the External Evaluation Panel.

Part 5. Proposed programme schedules *(post Panel feedback and consequent amendments, if any)*