Advanced Analytics Solutions

Qualification Specification

The Advanced Analytics Solutions Level 4 Improvement Practitioner Qualification

Qualification number: 610/2356/5

Qualification Summary

Qualification Title	Advanced Analytics Solutions Level 4 Improvement Practitioner Qualification
Ofqual qualification number (QN)	610/2356/5
Guided Learning Hours (GLH)	100
Total Qualification Time (TQT)	360
Minimum Age	19
Qualification Purpose Summary	This qualification is designed for learners who wish to Identify and lead the delivery of change across organisational functions and processes. The qualification will develop the learner's skills at leading smaller improvement projects and/or play a key supporting role in a larger improvement programme – tackling issues that may require swift problem solving, or re-occurring challenges that require in-depth analysis and the implementation of a range of effective and sustainable countermeasures. This qualification will help learners identify potential opportunities, diagnosing issues, proposing solutions and lead small teams to implement changes.
Grading	Fail/Pass/Merit/Distinction
Assessment Methods	Multiple Choice Exam, Work Based Project Report, Professional Discussion
Work/Industry placement experience	Learners must produce a report detailing a work-based improvement project that they have identified, scoped and delivered using a recognised improvement methodology.

Change Control

This section summarises the changes made to this qualification specification.

Version	Publication Date	Summary of Changes
1.0	April 2023	First publication
2.0	May 2023	Minor clarity related amendments
3.0	June 2023	Amended guidance on entry requirements

SECTION ONE - INTRODUCTION

Introduction

If you are using this qualification specification for the purposes of planning training delivery, please ensure that you use the most up to date version.

In the event of a conflict between this document and the assessment plan published by the Institute for Apprenticeships and Technical Education then the latter takes precedence.

Aims and Objectives

This qualification prepares learners to lead teams to deliver small improvement projects in their workplaces using a formal, recognised, improvement methodology such as Lean Six Sigma.

The qualification focusses on the knowledge, skills and behaviours required to successfully deliver improvement projects across a range of workplace settings.

The objectives of this qualification are to develop skills in:

- Identifying potential opportunities, diagnosing issues, proposing solutions, and implementing changes and controls
- Coaching teams and sharing best practice
- Leading and managing small teams, ensuring motivation and momentum, while responsible for the successful completion of the project.

Support Handbook

This qualification specification must be used alongside the Guidance Handbook for Employers, Learners, and Training Providers, which is available on request as well as the formal Assessment Plan available from the Institute for Apprenticeships and Technical Education. This handbook contains additional supporting information to help with planning and delivery. This handbook also contains general information on assessment to help learners, employers and training providers plan.

This qualification specification contains all the qualification-specific information you will need that is not contained in the Guidance Handbook.

Guidance for entry and registration

This qualification is designed for learners who wish to Identify and lead the delivery of change across organisational functions and processes.

Registration is at the discretion of the Training Provider, in accordance with equality legislation, and Individual employers will set their own entry requirements.

There are no specific prior skills or knowledge a learner must have for this qualification; however, learners will find it helpful if they have recent experience of delivering improvement through a formal methodology such as Lean Six Sigma, 8D or similar.

Training Providers are responsible for ensuring that learners are capable of achieving the learning outcomes (LO's) and complying with the relevant literacy, numeracy and health and safety requirements.

Learners registered on this qualification should not undertake another qualification at the same level, or with a similar title, as duplication of learning may affect eligibility for funding.

Achieving this qualification

To be awarded this qualification, learners are required to successfully achieve a pass or better in each of three mandatory assessment methods.

Refer to the qualification content for further information.

To achieve this qualification, learners must successfully demonstrate their achievement of all of the knowledge, skills and behaviour criteria as detailed in this qualification specification.

Progression

Learners who achieve this qualification could progress to many further learning opportunities including the following:

- Level 5 Improvement Specialist

Resource requirements

There are no mandatory resource requirements for this qualification, but Training Providers must ensure learners have access to suitable resources to enable them to cover all the appropriate learning objectives.

Learners will find it useful to have access to:

- Standard office IT equipment to gather, analyse and present data
- Data analysis software such as Minitab, JMP, SPSS, SigmaXL, Data Analysis Toolkit

How this qualification is assessed

Assessment is a process of measuring a learner's knowledge and skill against the standards set in a qualification.

This qualification is externally assessed and quality assured.

The assessment consists of three components:

- A multiple choice examination, externally graded
- An externally assessed workplace based improvement project
- An externally assessed portfolio of evidence

Learners must achieve at least a pass in each of these assessments to gain this qualification.

All the evidence generated by the leaner will be assessed against the standards expected of a Level 4 Improvement Practitioner for each learning objective.

Unless otherwise stated in this specification, all learners taking this qualification must be assessed in English and all evidence presented for external assessment must be in English.

SECTION TWO – CONTENT AND ASSESSMENT GUIDANCE

This section provides details of the structure and content of this qualification.

The types of evidence listed are for guidance purposes only. Other types of evidence are acceptable if all learning outcomes are covered, and if the evidence generated can be externally assessed and quality assured.

The explanation of terms shows how the terms used in the qualification content are applied to this qualification, this is contained in Section Three.

Assessment Method 01 Multiple Choice Examination

Assessment Summary		
This mandatory assessment element consists of a 40 minute long, 40 question, multiple choice examination. To pass this assessment element learners must achieve 25 correct answers. This is an "open book" examination where learners may refer to training material or reference books but may not access computer search engines or similar. Please refer to the Guidance Handbook for Employers, Learners, and Training Providers for further information regarding the ID verification process and details regarding the set-up of assessments. While on-programme, the employer/training provider should brief the apprentice on the areas to be assessed by the multiple-choice examination. In readiness for the end-point assessment, the apprentice should complete a practice examination which are provided on request.		
KSB Ref. Number	**Knowledge, Skill or Behaviour criteria**	**Learning Objectives** ***The leaner knows …***
K1	Compliance	• The employees and employers' main duties under the Health and Safety at Work Act 1974 • How to work safely • The main legislative requirements of business operations • The customer compliance requirements of the business
K3	Project management	• How to prepare a simple business case through risk analysis and management • How a toll-gate review process operates • The purpose of creating a work breakdown structure • How to track benefits in project management • The purpose of process management when managing projects

K5	Change Management	• How to apply the RACI model to managing change • Typical responses to organisational and personal change as outlined in change curve theory • The role of the sponsor in managing change • How organisational change is supported by compelling narratives
K6	Principles and Methods	• How to explain the business value of Lean Six Sigma methodology • The purpose of each of the DMAIC phases Lean Six Sigma problem solving • The purpose, and main outcomes, of the 8D approach to problem-solving • The main principles and business value of Lean
K7	Project Selection and Scope	• How to select projects based on benefit vs effort • How to interpret the use of Y=f(x) equation in determining project selection
K8	Problem definition	• The meaning of cost of poor quality • A range of common problem analysis models, for example, Is/Is Not
K9	Process mapping and Analysis	• The purpose of 'swim lanes' in flow diagrams • The objectives of value stream mapping • How Takt time is calculated • The three factors in Overall Equipment Effectiveness (OEE) and how to calculate OEE • Theory of Constraints – key principles • The use of Kanbans
K10	Data Analysis	• How spreadsheets and pivot tables are used in data analysis • The correct graph or chart to use for given data types
K11	Measurement systems	• How to conduct and interpret a Gauge R&R study • The difference between repeatability and reproducibility when appraising measurement systems • The meaning of the term "bias"
K12	Basic Statistics and measures	• The main features of a control chart • How to interpret a control chart for stability • The difference between capability and stability
K13	Data analysis – statistical methods	• The three main measures of central tendency • The two main measures of spread • How to evaluate the relationship between the measure of spread and the measure of central tendency in data analysis

K14	Process capability and Performance	• How the purpose of a process capability analysis • Why continuous data is used in capability analysis • How to interpret the main outputs of capability (Cp, Cpk) • How to evaluate the validity of the results from a capability analysis
K15	Root cause analysis	• The difference between failure mode, failure cause and failure effect • The importance of understanding the critical inputs of a process • The purposes and advantages of visually representing data in graphical form • The correct graph or chart to select to visually illustrate prioritisation or cause and effect relationships between different types of data. Typical graphs include time series plots, Control Charts, histograms, box plots, scatter plots and Pareto charts • The purposes and advantages of visually representing cause and effect relationships in graphical form using cause and effect (fishbone) diagrams • The objective of verifying potential root causes of a problem
K16	Experimentation	• The difference between active and passive experimentation • The purpose of designed experiments • The purpose of designing an experimentation plan • How to describe simple experiments in terms of factors and levels
K17	Identification and prioritisation	• How to identify factors to consider when selecting improvement projects • The main elements of a Failure Mode and Effects Analysis • The purpose of a Failure Mode and Effects Analysis

Assessment Method 02 Work Based Project Report

Assessment Summary
This mandatory assessment element consists of a learner delivered project presentation lasting between 30 and 40 minutes followed by assessor questioning on the project lasting 25 to 35 minutes. During the on-programme element of the qualification, the apprentice should have been working on one or more improvement projects and must produce a project report that details at least one of the projects they have delivered. The report must follow each step of one of the recognised problem-solving methodologies e.g. 'Define, Measure, Analyse, Improve, Control' (DMAIC), '8 Disciplines (8D)', 'Practical Problem Solving' etc. The report must be a concise, visual summary that follows the principles of 'A3 Thinking', conveying key points in a way that enables messages to be grasped 'within 3 seconds'. The apprentice should clearly explain the reasons for project selection, how each improvement tool was used, the business benefit of the project including a key performance indicator measure (for example, hours saved or money saved) and how the apprentice worked with a team of people during this project. Details of other arrangements, including employer representative attendance, may be found in the Guidance Handbook. To pass this assessment element learners must achieve all criteria at pass level. To achieve a merit in this assessment all pass criteria and all merit criteria must be met, to achieve a distinction all pass, merit and distinction criteria must be met. KSB's S1, S4, S5, S6, S7, S8, S9, S10, S11, S19 and S22 are assessed holistically as following the steps of a recognised problem solving methodology with a clear flow from one step to another. To achieve a merit learners must clearly explain how the outputs of each tool are used to inform the next step and to share or replicate the improvements made to other areas where there are differences in solutions or controls. A distinction is awarded when the pass and merit criteria have been met and the learner replicates the improvements made to another area where there are differences in baseline metrics and seeks opportunities to apply the tools in daily work. KSB's S12, S13, S14, S15, S16, S17, S18 and S20 are assessed holistically as demonstrating data-baked decision making. KSB's S7, S6, K2 and K4 are assessed holistically as presenting the project using a concise visual format.

KSB Ref. Number	Learning Objectives *The learner can …*
S22 Sustainability & Control	• Create statements of business benefit to the employer through calculation of monetary value and ROI • Calculate non-monetary benefit based on quantifiable metrics such as time saved • Show that the project report, and the lesson learned, has been shared across the organisation (such as minutes of a meeting, action logs, meeting records etc)

	• Identify improvement failure modes in PFMEA or DFMEA analysis along with RPN's shown and mitigation actions implemented

S1 Compliance	• Show how they have worked in accordance with organisational controls and statutory requirements such as:
	  • COSHH assessments
	  • Creating or following risk assessments
	  • Working to regulations or legislative needs such as Food Hygiene or GMP in Pharmaceuticals

S3 Coaching	• Observe, listen and use questioning techniques, provide feedback and spot learning opportunities
S4 Project management	• Follow a recognised problem solving methodology with clear step to step flow and tool usage • Share progress throughout the project using a formal method such as gateway, milestone or phase exit meetings • Plan and manage the project using formal methods such as Gantt charts • Present their project in clear DMAIC (or other methodology) phases
S5 Change Management	• Engage others through change management • Explain sponsorship contracts • Complete a Stakeholder Management grid with strategies identified and plan implementation for these • Document their narratives for change - burning platforms etc • Apply formal change management approaches (such as Kotter's 8 Steps)
S6 Principles and Methods	• Follow a structured method (such as DMAIC, 8D, DMADV) • Identify and apply the 5 Lean principles (such as VVFPP) • Calculate clear business benefit showing ROI
S7 Problem Selection and Scoping	• Explain their role in identifying the improvement project (such as a selection matrix or Y=f(x) cascade) • Explain how the project was scoped to be "right size" with clear measurable objectives
S8 Problem Definition	• Create a project charter with separate and distinct problem and goal statements • Explain "What is wrong with what and by how much" for their project
S9 Voice of the Customer	• Obtain and explain the voice of the customer and voice of the business relevant to their improvement project • Explain how competing demands between VoC and VoB are balanced • Translate VoC into quantifiable metrics (VoC Tree)
S10 Process Mapping and Analysis	• Complete a SIPOC analysis that may also include requirements • Complete an activity process map, including swimlanes and interfaces where appropriate • Complete a Value Add (VA) & Non-value Add (NVA) analysis with Future State Improvement hotspots identified for their project

	• Complete a current state Value Stream Map (VSM)
S11 Lean Tools	• Select and apply appropriate Lean tools (such as 5S, 8 Wastes (TIMWOODS), Standard work etc)
S19 Identification & Prioritisation	• Identify & prioritise improvement solutions using Effort/Benefit matrix • Identify solutions through brainstorming or other appropriate creativity tool
S12 Measurement Systems	• Plan, execute and evaluate a formal measurement system study (GR&R or AAA) • Evaluate and draw conclusions from an appropriate measurement study
S13 Data Acquisition for Analysis	• Develop a sampling strategy • Document their data collection plan • Explain how sampling strategy affects their results (if any)
S14 Basic Statistics and Measures	• Use graphs to show distribution and stability of their date (these could include histograms, distribution plots, normality plots, SPC Charts (IMR minimum) with understanding of stability)
S15 Data Analysis – Statistical Methods	• Correctly identify different data types and select the correct analytical technique • Explain the variation in the studied process • Explain the conclusions of their analysis
S16 Process capability and performance	• Analyse product or process performance • Carry out continuous, normal data Capability analysis • Explain Cp/Cpk with conclusion
S17 Root Cause Analysis	• Visually represent cause and effect relationships using Cause and Effect diagrams • Demonstrate cause and effect relationship using appropriate graphs such as histograms, boxplots etc. • Identify patterns in data and reach conclusions about hypotheses
S18 Experimentation and Optimisation	• Plan and execute simple full fractional designed experiments with analysis and optimisation • Explain the conclusions reached
S20 Data Analysis – SPC	• Select, apply & interpret tools for ongoing monitoring and control such as control charts with before/after • Explain the concept of stability, in and out of control conditions, and assignable causes
K2 Team formation and Leadership	• Explain their role in the team using a team list with roles or a RACI • Deliver meetings to engage others through insights

K4 Presentation and Reporting	• Follow a recognised improvement methodology such as DMAIC, 8D, VVFPP, DMADV etc • Present the project in a logical manner using A3 or 6 Panel format • Speak & writes clearly • Demonstrate a clear case for change
Merit Criteria ***In addition to satisfying all the pass criteria the following must also be met to achieve a merit award***	
S7, S8, S9, S10, S11, S12, S13, S14, S15, S16, S17, S18, S19, S20, S22	• In addition to satisfying all criteria for a pass • Can clearly explain how the outputs of each tool are used to inform the next step
B1 Drive for Results	• Identifies and takes the opportunity to share and/or replicate the improvements made to one other area/system where there are differences in the solutions/controls required to deliver successful outcomes.
Distinction Criteria ***In addition to satisfying all the pass and merit criteria the following must also be met to achieve a distinction award***	
B1 Drive for Results	• Identifies and takes the opportunity to share and/or replicate the improvements made to one other area/system where there are differences in baseline metrics.
B4 Continuous Development	• Seeks opportunities to apply Lean, Six Sigma, Project and Change Management Tools in daily work.

Assessment Method 03 Professional Discussion

Assessment Summary
This mandatory assessment element consists of a learner led professional discussion lasting between 50 and 60 minutes to include up to 15 open style questions from the assessor to clarify or follow up evidence. The apprentice will discuss and present the evidence of their training, learning and workshops undertaken. Their log should clearly demonstrate the completion of any training, learning, and workshops attended and must have a minimum of one piece of evidence for each of the required criteria. Details of other arrangements, including employer representative attendance, may be found in the Guidance Handbook. To pass this assessment element learners must achieve all criteria at pass level. To achieve a merit in this assessment all pass criteria and all merit criteria must be met, to achieve a distinction all pass, merit and distinction criteria must be met.

KSB Ref. Number	Learning Objectives *The learner shows how they …*
B1 Drive for Results	• Encourages others to deliver results across functional areas capturing and standardising best practice
B2 Team Working	• Are awareness of their own and others' working styles • Create high-performing team (s)
B3 Professionalism	• Work in a moral, legal and socially appropriate manner • Align their behaviour to their organisations values • Maintain flexibility to the needs of their project
B4 Continuous Development	• Proactively seek and act on feedback received • Reflect on performance and have a desire for development • Adapt quickly to working with new situations/stakeholders/challenges
B5 Safe working	• Ensured the safety of self and others
K2 Team Formation and Leadership	• Used methods for making decisions in the project team
S2 Communication	• Engaged and influenced others • Are able to speak and write clearly • Are able to plan and deliver meetings, presenting insight
S3 Coaching	• Observe, listen and use questioning techniques, provide feedback and spot learning opportunities

S4 Project Management	• Define, sequence, plan and schedule activities with phases and milestones • Estimate effort and duration
S5 Change Management	• Surface and manage resistance • Build compelling narratives for change • Assess the impact of change
S18 Experimentation & Optimisation	• Approach results and learning relating to experimentation and optimisation • Plan designed experiment with clear objectives and appropriate MSA • Analyse experiment data and optimise the process
S21 Benchmarking	• Use benchmarking to inform target setting and improvement options
Merit Criteria ***In addition to satisfying all the pass criteria the following must also be met to achieve a merit award***	
B1 Drive for Results	• Identify opportunities for cross-functional improvement
B4 Continuous Development	• Support delivery of business-wide improvement projects led by Improvement Experts
Distinction Criteria ***In addition to satisfying all the pass and merit criteria the following must also be met to achieve a distinction award***	
B1 Drive for Results	• Take the opportunity to prepare and/or deliver training to upskill colleagues
B4 Continuous Development	• Seek opportunities to involve others in building a Continuous Improvement Culture

SECTION THREE – EXPLANATION OF TERMS

This table explains how the terms used are applied to this qualification (not all verbs are used in this qualification)

Define	Give the meaning of a word or phrase
Demonstrate	Show an understanding of a subject
Describe	Provide details about the subject or item
Explain	Provide details about the subject with reasons showing how or why
Give examples of …	Provide relevant examples to support the subject
Identify	List or name the main points
Indicate	Point out or show using words, illustrations or diagrams
Locate	Find or identify
List	Make a list of words, sentences or comments
Outline	Identify or describe the main points
Plan	Think about, organise and present information in a logical way. This could be presented in writing, as diagrams or an illustration.
Show	Give information that includes clear knowledge about the subject
State	Give the main points in brief, clear sentences
Use	Take an item, recourse or piece of information and link it to the question or task.

SECTION FOUR – SUPPORT

Support Materials

The following support materials are available to assist with the delivery of this qualification and are available on our website, via ACE360 or on request.

- Guidance Handbook for Employers, Learners, and Training Providers
- Learning resources
- Guidance materials by KSB

We do not explicity endorse any source of learning materials however there is a wealth of material available on the topic in academic textbook, media and social domains. Training Providers are cautioned to be circumspect when selecting sources.

Reproduction of this document