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Empirical validation of the Strengthened Australian
Qualifications Framework using Item Response Theory

Conducted for the Australian Qualifications Framework Council
as part of the Strengthening the AQF project

Volume 1:
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It was commissioned to empirically test the levels criteria, the qualification type descriptors and the placement of Australia's qualifications at a level in the proposed strengthened Australian Qualifications Framework (AQF). This volume of appendices accompanies Volume 1: Final Technical Report. An overview of the research, the findings and the AQF Council response is also available on the AQF website.

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Key Terms and Definitions

Qualification Terms and Definitions

AQF Levels	An AQF Level is an indication of the relative complexity and/or depth of achievement and the autonomy required to demonstrate that achievement. There are ten levels of complexity. AQF Level 1 has the lowest complexity. AQF Level 10 has the highest complexity.
Levels Criteria (also referred to as 'Criteria')	Levels Criteria describe the relative complexity and/or depth of achievement and the autonomy required to demonstrate that achievement for each AQF Level 1 to 10. Each AQF level is described by a set of Levels Criteria.
Notional Duration of Student Learning	Notional Duration of Student Learning is the estimated time it takes a student, on average, to complete all learning and assessment activities required for the achievement of a qualification.
Qualification Type	A Qualification Type refers to the nomenclature used for a qualification that is specific to the AQF such as 'Certificate III', 'Bachelor Degree', or 'Vocational Graduate Diploma'.
Qualification Type Descriptors (also referred to as 'Descriptors')	A Qualification Type Descriptor is the statement that describes the learning outcomes of each AQF Qualification Type. Each Qualification Type is described by a set of Qualification Type Descriptors.
Statements	A statement is a collective term used within this report to describe the Levels Criteria and/or Qualification Type Descriptors.

Technical Terms and Definitions

Item Response Theory	Item Response Theory (IRT) is a methodology that uses a probability function to describe the likelihood that a respondent would give a particular rating to a Qualification Type against a particular statement. Through the use of the probability function, conclusions can be drawn about the relative standing of Qualification Types and statements, as both are calibrated on the same measurement scale.
Logit value	The use of IRT can create an interval scale of measurement for describing both the complexity of the items and the Qualification Types being rated. These complexity measures are reported in units called logits and are typically placed on a vertical ruler called a

logistic ruler. This means that the logit value of one statement and/or Qualification Type can be directly compared to the logit value of another statement and/or Qualification Type (similar to how we measure the length of different objects using the same metric scale and make direct comparisons and conclusions about differences).

Complexity Estimates	An estimate of complexity for each statement and Qualification Type that ranged from 100 (lowest complexity) to maximum estimate of 200 (highest complexity). A linear transformation was applied to the logit scores to produce the complexity estimates.
Discrimination Index	The discrimination index is a correlation coefficient that ranges from 0 to 1, with a value of '0' indicating that the statement had no discrimination to a value of '1', which indicates that the statement was highly discriminating between Qualification Types of varying complexity.
Qualification Type Complexity	A Qualification Type Complexity refers to the average complexity estimate of a Qualification Type.
Average Descriptor Complexity	The Average Descriptor Complexity refers to the average complexity estimate of the set of descriptors used to describe a particular Qualification Type.
Level Complexity Range	The difference between the maximum and minimum complexity estimate within the set of Levels Criteria.
Descriptor Complexity Range	The difference between the maximum and minimum complexity estimate within the set of Qualification Type Descriptors.

Summary

Aims and Objectives

This study set out to empirically examine the revised architectural design of the Strengthened Australian Qualifications Framework (AQF) (Version 6). Through the use of survey methods and Item Response Theory, the study was able to:

- Estimate the complexity of each Levels Criteria, and for each set, compare the average estimates against the proposed 10 levels structure.
- Examine the ordered nature of the Levels Criteria according to the Knowledge, Skills and Application dimensions.
- Estimate the complexity of each Qualification Type Descriptor for each of the 14 Qualification Types.
- Directly estimate the complexity of each Qualification Type by aggregating respondent results.
- Determine the overall complexity estimate of each of the 14 Qualification Types.
- Identify any potentially redundant and non-discriminating Levels Criteria and/or Qualification Type Descriptors.
- Empirically calibrate the Qualification Type Descriptors and the Levels Criteria on the same scale.
- Determine where each Qualification Type was typically positioned within the proposed 10 levels structure.
- Investigate the perceived appropriateness of the assigned notional duration of student learning for each Qualification Type.

Methodology

There were 159 unique statements to be tested within the Levels Structure and Qualification Types. A 20 minute on-line survey was designed featuring multiple forms and link items to minimise the workload of any respondent, and at the same time, collect data on all 159 items. This meant that each respondent was required to complete approximately 50 items per questionnaire. Each item was also presented randomly to avoid an item positioning effect. Each respondent was required to supply background information as well as select a Qualification Type that would form the focus of his/her responses to the questionnaire. Each respondent was then required to rate whether a particular statement¹ was 'too low', 'at this level' or 'too high' in terms of the learning outcomes expected of the selected Qualification Type.

¹ The term 'statement' is used within this report to refer to the Levels Criteria and/or Qualification Type Descriptors.

The data was then analysed using Item Response Theory (IRT) which enabled the complexity of the statements and Qualification Types to be estimated using the same scale of measurement (expressed in the form of logit units). This meant that the complexity estimate of one statement and/or Qualification Type could be directly compared to the estimate of another statement and/or Qualification Type (similar to how we can measure the length of different objects using the same metric scale and make direct comparisons and conclusions about differences). For ease of interpretation of the measurement scale, a linear transformation was applied in which the statement complexity estimates ranged from a minimum score of 100 (indicating the statement with the lowest complexity) to a maximum score of 200 (indicating the statement with the highest complexity estimate on the scale). In addition to the complexity estimates, the performance of each statement was also reviewed according to its discrimination. Low discrimination indicated that the statement was not able to separate Qualification Types of varying complexity as well as other statements with higher discrimination.

Results

The results were presented in four main sections. Each is summarised below.

The Sample (Section 1)

Seven-hundred and eighty-eight individuals, from a wide range of fields of study, participated in the national on-line survey. Respondents represented the higher education, vocational education and senior secondary education sectors. Although all states and territories were represented in the sample, the majority of respondents were from New South Wales (29%) and Victoria (27%), with very few respondents located in Northern Territory (1%), Tasmania (1%) and the Australian Capital Territory (4%).

Notional Duration of Student Learning (Section 2)

The study found that 76% of the respondents were in favour of the notional duration of student learning specified for the Qualification Type selected. With the exception of Certificate III, the majority of respondents either agreed or strongly agreed to the notional duration of student learning specified for the Qualification Type selected. In relation to Certificate III, the findings were inconclusive with approximately half of the respondents in agreement (agreeing or strongly agreeing) to the time frame specified; and the other half in disagreement (i.e., those that selected disagree or strongly disagree). Although qualitative feedback was gathered to further explore respondent disagreement, the findings for Certificate III were contradictory. For example, some individuals argued that the time frame was too short for the Certificate III; whilst others argued it was too high. It is interesting to

note that the Certificate III Qualification Types which were classified as trade-apprenticeship had higher occurrences of disagreement (61%) than those which were non-trade.

The Levels Criteria (Section 3.1)

The Levels Structure, as expected, was hierarchical and cumulative, covering a wide range of complexity. However, the item response analyses revealed that there were some levels on the framework (namely, Level 2 and Level 7) which may benefit from minor modifications to some of the individual criteria to increase the overall complexity of each set. Increasing the complexity of the sets of Levels Criteria for Levels 2 and 7, and possibly reviewing a criterion within Level 9 (i.e., L009K1), would improve the gradual progression of complexity across the 10 band levels.

Qualification Type (Section 3.2)

The item response analyses revealed that:

- The sets of descriptors for each Qualification Type had levels of complexity which were generally in accordance with expectations. The exception to this was the Average Descriptor Complexity for the Associate Degree which was lower than those for the Advanced Diploma and Diploma. Furthermore, the set of descriptors for the Advanced Diploma were, on average, similar in complexity to the Bachelor Degree and Bachelor Honours Degree; and
- The aggregate Qualification Type Complexity for each of the 14 Qualification Types (which may provide an indication of current practice) was generally as expected. Furthermore, estimates of Qualification Type Complexity were, in general, closely aligned to the Average Descriptor Complexity for each Qualification Type.

The relationship between the Levels Structure and Qualification Types (Section 3.3)

The relationship between Qualification Type Complexity, Descriptors and Levels Structure was explored in Section 3.3. It was found that Qualification Type Complexity was within the Descriptor Complexity Range for all Qualification Types and, in most cases, was also within the complexity range for the proposed level. The Associate Degree, Bachelor Honours Degree and Graduate Certificate/Graduate Diploma and possibly the Certificate II, Bachelor Degree and Master Degree (if suggested changes to Levels 2, 7 & 9, respectively are made to the criteria) all had Qualification Type Complexity estimates that were lower than the proposed Level Complexity Range. This may imply that current practice for these Qualification Types is below the AQF's expected level of complexity.

The Descriptor Complexity Range closely matched the proposed Level Complexity Range for the Senior Secondary Certificate of Education and Certificates I to IV. At the higher levels, there was a tendency for the Descriptor Complexity Range to be lower than the proposed level. This suggests that the descriptors for the higher level qualifications need to be reviewed to increase their complexity to more closely align the descriptors to the levels they are proposed to be aligned to (e.g. removing or rewording any outliers).

Statements for Review (Section 3.4)

The results presented in Section 3 identified statements that may need to be reviewed. These statements were grouped together and classified as low, medium or high priority for review after examination of their complexity estimates and discrimination. Statements with unexpectedly high or low complexity estimates and low discrimination were classified as high priority for review. Statements with good discrimination but unexpectedly high or low complexity were identified as medium priority for review while statements with low discrimination but expected complexity estimates were classified as low priority for review.

Aims and Objectives

This study set out to empirically examine the revised architectural design of the Strengthened Australian Qualifications Framework (Version 6, refer to Appendix 1). There were four elements of the strengthened framework that were to be examined:

1. A levels structure with ten levels expressed as learning outcomes (referred to as Levels Criteria)
2. Revised descriptors for each of the existing 14 Qualification Types (and two kinds) expressed as learning outcomes (referred to as Qualification Type Descriptors).
3. The interaction between the Qualification Types and the Levels Structure.
4. A measurement of the notional duration of student learning for each Qualification Type.

The study was designed to examine the measurement properties of three of the four elements listed above (i.e., 1, 2 & 3). It was also designed to examine the appropriateness of the assigned notional duration of student learning for each Qualification Type (i.e., 4). To examine the measurement properties of the Levels Criteria and the Qualification Type Descriptors (hereon referred to as 'statements'), it was proposed that the statements be empirically tested and validated through survey methods. It was further proposed that the survey data be analysed using Item Response Theory². It was envisaged that such a proposal would enable the:

- Complexity of each Levels Criteria to be estimated and compared against the proposed 10 levels structure.
- Ordered nature of the Levels Criteria to be investigated according to the Knowledge, Skills and Application dimensions.
- Complexity of each Qualification Type Descriptor to be estimated for each of the 14 Qualification Types.
- Identification of any redundant/non discriminating Levels Criteria and/or Qualification Type Descriptors.
- Qualification Type Descriptors and the Levels Criteria to be empirically calibrated on the same scale.
- Overall complexity estimate of each of the 14 Qualification Types to be estimated and compared to where it typically sits within the proposed 10 levels structure.
- Appropriateness of the assigned notional duration of student learning for each Qualification Type to be determined.

² Item Response Theory (IRT) is widely used to analyse data in large scale educational assessment programs nationally and internationally (see Methodology Section for more detail).

Methodology

There were four stages to this project:

- Stage 1: Survey Design.
- Stage 2: Pilot Study.
- Stage 3: Data Collection.
- Stage 4: Data Analysis and Reporting.

Each stage is described below.

Stage 1: Survey Design

An on-line questionnaire was designed to:

- Collect information on the complexity of each statement within the Levels Structure and Qualification Types. Each statement formed a separate item on the survey. This enabled diagnostic information to be gathered for each item, rather than simply for the set of criteria for a Level or set of descriptors for a Qualification Type.
- Randomly present items to ensure that the ordered nature of the items *could not* be determined by the respondent using cues unrelated to the actual content of the items; and to avoid an item positioning effect in which there is a tendency for those items that are positioned toward the end of the questionnaire to have a higher proportion of missing data or guessing responses due to fatigue and/or boredom.
- Restrict respondents from moving onto the next item until the previous item had been completed to minimise missing data on some items that may be more difficult to rate.
- Minimise the workload of any one respondent by designing a number of alternative forms so that not all individuals had to complete the same set of items, nor did any one individual have to rate all items. This required designing alternative questionnaire forms that had:
 - Common items across forms (to allow each form to be linked to another form so that all items could be calibrated on a single scale); and
 - Items within 3 or 4 levels of the Qualification Type being rated.
- Randomly present a form for those Qualification Types in which there were multiple forms. This would help to:
 - Minimise the likelihood that some items are rated against just a few specific Qualification Types; and to

- Ensure adequate linkage of forms to enable all items to be calibrated onto a single scale.
- Enable a respondent to return to an incomplete form at a later time.
- Provide easy reference to a glossary of terms to assist with interpreting the language used to describe the Levels Criteria and Qualification Type Descriptors.

There were four main steps that underpinned the design of the on-line survey:

1. Establishing the set of assumptions that underpinned the design of the Strengthened AQF.
2. Identifying the set of statements to be validated.
3. Creating alternative forms.
4. Designing the questionnaire sections and items.

1.1 Establishing the set of assumptions that underpinned the design of the Strengthened AQF

Step 1 required determining the set of assumptions that underpinned the development of the Levels Criteria and Qualification Type Descriptors. The following assumptions were identified:

- The overall framework was designed to illustrate a developmental learning pathway. Therefore, the Levels Criteria should be strictly hierarchical and cumulative in nature. To a lesser extent, so too should the Qualification Type Descriptors be hierarchical and cumulative in nature;
- Each set of Levels Criteria, as a whole within a level, should clearly demonstrate increasing complexity from one level to the next;
- The Levels Criteria and Qualification Type Descriptors should be clear and explicit in their description of increasing complexity;
- Both the Levels Criteria and Qualification Type Descriptors should be content and context free, that is, they should not identify the learning or the workplace context nor the educational sector in which the Qualification Type was typically delivered;
- There were three dimensions (i.e., Knowledge, Skills and Application) that underpinned both the Levels Structure and the Qualification Types;
- Within each dimension, the criteria and descriptors should represent a wide range of levels of complexity (i.e., across all qualifications from Certificate I to Doctoral Degree);

- Each dimension should be internally coherent in that the set of statements (i.e., both Levels Criteria and Qualification Type Descriptors) should describe a single underlying construct;
- Each of the dimensions should contribute to some unique aspect of measuring complexity of learning outcomes;
- Each Qualification Type was described by a set of Qualification Type Descriptors which were intended to capture the desired complexity of the learning outcomes for each Qualification Type.
- Some individual descriptors within a set could be used to describe one or more Qualification Types within another set. It is the unique combination of descriptors (i.e., that form a set) that makes the description of the Qualification Type unique, not the individual descriptors themselves; and
- More than one Qualification Type could be positioned at the same level on the framework.

1.2 Identify the set of statements to be validated

The AQF Council provided the research team with Version 6 (testing) of the Levels Criteria and Qualification Type Descriptors that were to form the basis of the survey (see Appendix 1). Each of the statements were to form a separate item on the questionnaire. In Version 6, there were 186 individual statements that described either the Levels Structure or the Qualification Types. Each of the 186 statements was labelled with a unique code (refer to Appendix 2 for a complete listing of all statements and codes).

In relation to the Levels Criteria, each criterion was given a six character code. The first character represented the Levels Structure (L), followed by the next three characters representing the proposed level on the Levels Structure (ranging from 001 to 010), and the last two characters summarised the dimension (i.e., Skills (S), Knowledge (K) or Application (A)) as well as the positioning of the statement within that dimension (for example, whether it was listed first, second or third within the dimension for that particular level, as displayed in Appendix 1). For example, L001S2 indicated that the statement was from the Levels Structure (L); thought to be positioned at Level 1 on the 10 level framework (001) and that it was the second statement within the Skill Dimension (S2). The Levels Criterion statement for L001S2 was *“Graduates at this level will have foundational cognitive, technical and communication skills to identify and report issues and problems”*.

A similar coding system was used to describe the 14 Qualification Type Descriptors. Again, the first character indicated that it was a Qualification (Q). The next three characters represented the Qualification Type (see Table I), and the last two characters summarised

the dimension (i.e., Skills (S), Knowledge (K) or Application (A)) as well the positioning of the statement within that dimension.

The three character codes used to summarise the Qualification Types has been presented below. Note that the Master Degree and Doctoral Degree Qualification Types have two kinds: Other and Research. Both kinds of post graduate qualifications have been given a unique 3 character code for the purposes of this study.

Table I: Codes for each Qualification Type

Qualification Type	3 Character Code		Qualification Type/Kind	3 Character Code
Senior Certificate of Education	SSC		Bachelor Degree	BAD
Certificate I	CT1		Bachelor Degree with Honours	BAH
Certificate II	CT2		Graduate Certificate	GCT
Certificate III	CT3		Graduate Diploma	GDP
Certificate IV	CT4		Master Degree (Research)	MDR
Diploma	DIP		Master Degree (Other)	MDO
Advanced Diploma	ADP		Doctoral Degree (Research)	DDR
Associate Degree	ASD		Doctoral Degree (Other)	DDO

For example, the Code QBAHS1 indicated that the statement related to a Qualification (Q), namely the Bachelor Degree with Honours (BAH) and that it was from the Skills Dimension (S) and referred to the first dot point listed within this dimension (1). The Qualification Type Descriptor for QBAHS1 was “*Graduates of this qualification type will have well developed cognitive skills to critically review, analyse, consolidate and synthesise knowledge.*” Refer to Appendix 2 for the complete listing.

Although there were 186 statements in Version 6 (Testing), it was first necessary to identify where there was duplication across the Levels Structure and the Qualification Types. As each statement could be associated with more than one Qualification Type or Level, some of the statements were duplicated in the Strengthened AQF (see Section 1.1). By identifying and removing from the survey any statements that were repeated within the framework, the survey could be shortened to minimise the amount of workload for respondents.

Of the 186 original statements to be validated, 159 were found to be unique. There were no duplicate statements found in the Levels Criteria. Once the duplicated statements were identified, there were 50 Levels Criteria and 109 Qualification Type Descriptors that were to

be presented as unique statements within the survey. The listing of the duplicate statements³ across Qualification Types has been included in Appendix 2.

1.3 Creating Alternative Forms

The survey was designed to minimise the workload of any one respondent and, at the same time, collect data on all 159 statements. It was also desirable that the survey would take approximately 20 minutes to complete. This required designing five alternative forms that had common statements across forms (to allow each form to be linked to another form so that all statements could be calibrated on a single scale); and including statements within 3 or 4 levels of the Qualification Type being rated. The Qualification Types, levels and number of link statements as well as the total number of statements per form has been displayed in Table II. The 3 character Qualification Type Codes defined in Table I have been used again in Table II.

Table II: Qualification Types, Levels, number of link statements and total number of items per form.

Form	Qualification Type Code	Proposed Levels	Total Number of Link Statements	Total number of Items
A	CT1 CT2 CT3 SSC CT4	L001 to L004		54
B	SSC CT3 CT4 DIP	L003-L005	32 (from A to B)	46
C	DIP ADP ASD BAD	L005-L007	26 (from B to C)	61
D	ADP ASD BAD BAH GCT GDP	L006-L008	35 (from C to D)	56
E	BAH GCT GDP MDO MDR DDO DDR	L008-L0010	25 (from D to E)	60

As displayed in Table II, the maximum number of items to be completed by a respondent was 61 items for Form C, and the minimum number of items was 46 for Form B. It can also be seen that respondents were only required to rate the complexity of the Levels Criteria and Qualification Type Descriptors that were thought to be positioned slightly above and/or below the Qualification Type selected. For example, when respondents were to rate the statements

³ Duplicate statements have been identified throughout this report via the use of an asterisk (*) at the end of the six character statement code.

against the doctoral degree, descriptors for Certificate I to IV Qualification Types would not be presented.

The form to be completed was determined by the Qualification Type to be rated. Table III displays the number of forms that could be randomly assigned to each Qualification Type.

Table III: Qualification Type to be rated and possible forms to be randomly assigned.

Qualification Type	Qualification Type Code	Forms
Certificate I	CT1	A
Certificate II	CT2	A
Certificate III	CT3	A or B
Senior Secondary Certificate	SSC	A or B
Certificate IV	CT4	A or B
Diploma	DIP	B or C
Advanced Diploma	ADP	C or D
Associate Degree	ASD	C or D
Bachelor Degree	BAD	C or D or E
Bachelor Honours Degree	BAH	D or E
Graduate Certificate	GCT	D or E
Grad Diploma	GDP	D or E
Master Degree (Research)	MDR	E
Master Degree (Other)	MDO	E
Doctoral Degree (Research)	DDR	E
Doctoral Degree Other)	DDO	E

The survey was designed to randomly present a form for those Qualification Types where there were multiple forms. This helped to:

- minimise the likelihood that some items would be rated against just a few specific Qualification Types (i.e., to ensure sufficient data was collected for each statement); and to
- ensure adequate linkage of forms for calibration purposes.

1.4 Designing the Questionnaire Sections and Items.

The questionnaire had three sections:

- Background Information.
- Levels Criteria.
- Qualification Type Descriptors.

Each section is described below. A screen copy of the full version of the on-line questionnaire can be found in Appendix 3.

1.4.1 Part A: Background Information

The first part of the questionnaire was designed to collect background information about the Qualification Type being rated. A full copy of the background questionnaire can be found in Appendix 3. In summary, the following type of background information was collected about the respondent:

- The location (e.g., NSW, VIC, ACT);

- The educational sector represented (e.g., VET, Higher Education, Senior Secondary Education);
- The job role (e.g., Lecturer, Course Designer, Program Manager);
- The Qualification Type selected (e.g., Certificate I, Bachelor Degree)
- The name of the Qualification Type (e.g., Bachelor of Science) to form the focus of responses;
- The main field of study⁴ which best described the specific qualification selected (as described by the Australian Standard Classification of Education (ASCED)); and
- The appropriateness of the notional duration of student learning proposed for the Qualification Type selected.

With the exception of two items (i.e., the name of the Qualification Type and the notional duration of student learning), all items were in multiple choice format where the respondent had to select the most appropriate response from a given list (see Appendix 3). For the Qualification Type, participants were requested to supply the name of the qualification that was to form the focus of their responses. There were also some sub-category background questions concerning the Qualification Type to be rated (e.g. whether the qualification was a training package or accredited qualification). See Appendix 3 for a copy of the sub-category background questions.

In relation to the notional duration of student learning, respondents were requested to rate on a 4 point rating scale (from strongly disagree to strongly agree) the extent to which they agreed with the time frame specified (as depicted in Appendix A). If the respondent indicated that s/he disagreed or strongly disagreed with the timeframe, s/he was asked to provide qualitative feedback.

Note that each item in Part A of the survey had to be completed prior to proceeding to Part B to minimise missing data on any background items that may have been difficult to answer. The survey was also designed to allow a respondent to save and resume their progress at any stage.

1.4.2 Part B: Levels Criteria

Part B of the on-line survey was designed for individuals to rate the level of perceived complexity of the Qualification Type s/he had nominated to rate against a range Levels Criteria. Each criterion was rated using a 3 point rating scale (i.e., too low, at this level, too high). Participants were required to indicate whether the level of complexity and/or depth of achievement and autonomy described by the criterion was 'too low', 'at the level' or 'too high' for graduates of the selected Qualification Type. An example of Part B from Form A

⁴ Note that a hypertext link was made from the online questionnaire to the ASCED website to provide further information on each field.

(Certificate I) has been displayed in Figure 1. All items within Part B were required to be answered before proceeding to Part C.

Save and continue survey later

Australian
Qualifications Framework

Testing the strengthened AQF

Part B: Levels Criteria

Certificate I

For each of the levels criterion listed in the table below, indicate whether it adequately describes the level of complexity and/or depth of achievement and autonomy required to be awarded a Certificate I. There are three responses to choose from:

Too low	This indicates that the complexity described by this levels criterion is lower than the expected achievement for graduates of the Certificate I.
At this level	This indicates that the complexity described by this levels criterion is equivalent to the expected achievement for graduates of the Certificate I.
Too high	This indicates that the complexity described by this levels criterion is greater than the expected achievement for graduates of the Certificate I.

For each level criterion listed below, is the level of complexity and/or depth of achievement and autonomy too low, at the level, or too high for graduates of the Certificate I?

	Too low	At this level	Too high
apply knowledge and skills to demonstrate autonomy and judgement in structured and stable contexts and within established parameters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
apply knowledge and skills to demonstrate autonomy and judgement in known and stable contexts and within established parameters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have foundational knowledge for life, further learning and preparation for work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have a broad range of cognitive , technical and communication skills to select and apply a range of methods, tools, materials and information to provide and transmit solutions to a variety of predictable and unpredictable problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have a range of cognitive , technical and communication skills to select and apply a specialised range of methods, tools, materials and information to provide and transmit solutions to predictable and unpredictable problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
apply knowledge and skills to demonstrate autonomy , judgement and limited responsibility in known or changing contexts and within established parameters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Too low	At this level	Too high
have factual, technical , procedural and some theoretical knowledge of an area of work and learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have broad and integrated factual, technical and theoretical knowledge of a specialised area or a broad field of work and learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have basic cognitive , technical and communication skills to apply appropriate methods, tools, materials and readily available information to undertake defined routine activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have a range of cognitive , technical and communication skills to select and apply a specialised range of methods, tools, materials and information to complete routine activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 1: An example of Part B: Levels Criteria from the on-line survey

1.4.3 Part C: Qualification Type Descriptors

A similar format to that used for the Levels Criteria (i.e., Part B) was used to rate the perceived complexity of the Qualification Type Descriptors. An example of Part C of the survey using Form A (Certificate I) has been displayed next.

Save and continue survey later

Australian
Qualifications Framework

Testing the strengthened AQF

Part C: Qualification Type Descriptors

Certificate I

For each descriptor listed in the table below, indicate whether it appropriately captures the complexity of learning outcomes expected for the Certificate I.

Too low	This indicates that the complexity described by this learning outcome is lower than the expected achievement for graduates of the Certificate I.
At this level	This indicates that the complexity described by this learning outcome is equivalent to the expected achievement for graduates of the Certificate I.
Too high	This indicates that the complexity described by this learning outcome is greater than the expected achievement for graduates of the Certificate I.

For each qualification type descriptor listed below, is the complexity of the learning outcomes too low, at the level, or too high for graduates of the Certificate I?

	Too low	At this level	Too high
demonstrate the application of knowledge and skills by adapting and transferring skills and knowledge within known routines, methods, procedures and time constraints	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have basic skills to participate in life and further learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have cognitive and communication skills to apply and communicate known solutions to a variety of predictable problems and deal with unforeseen contingencies using known solutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
demonstrate the application of knowledge and skills with discretion and judgement in the selection of equipment, services or contingency measures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
demonstrate the application of knowledge and skills with autonomy in particular contexts and within established parameters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
demonstrate the application of knowledge and skills in a team environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have technical skills to undertake routine and non-routine tasks in a range of skilled operations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Too low	At this level	Too high
have cognitive skills to access, record and act on information from varied sources and literacy and numeracy appropriate to subject disciplines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have literacy and communication skills including everyday reading, writing skills and using information communication technologies skills to present knowledge and ideas to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have broad and integrated factual, technical and theoretical knowledge in a specialised field of work and learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
demonstrate the application of knowledge and skills with accountability for the quality of their own outcomes and responsibility for their own outputs in work and learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
demonstrate the application of knowledge and skills by taking responsibility for their own functions and outputs, and can have limited organisation of others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
have cognitive , technical and communication skills to interpret and act on available information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 2: An example of Part C: Qualification Type Descriptors from the on-line survey.

1.4.4 Additional Survey Features.

Glossary of Terms

The on-line questionnaire also included access to a Glossary of Terms developed by the AQF Council. The glossary was designed to enhance the consistency in the way the language used within the framework was interpreted. When the mouse cursor hovered over text highlighted blue, an explanation of the term was displayed in a “roll-over” text box. A copy of the Glossary of Terms used within the survey can be found in Appendix 4.

Qualitative Feedback (optional)

The survey was also designed to collect qualitative feedback from the participants. This component of the survey was optional. Comments provided by respondents have been provided in Appendix 9 for the AQF Council’s purposes (note that the analysis of this qualitative data was outside the scope of this study).

Stage 2: Pilot Study

2.1 Pilot and refinement of the on-line questionnaire

A small pilot study was undertaken to examine the usability and functionality of the on-line survey prior to launching the website. Specifically, the pilot study sought to examine the:

- Appropriateness of the workload of each participant (e.g., are there too many items to be completed by one respondent?);
- Appropriateness of the background questions (e.g., are these relevant and meaningful across all educational sectors?);
- Appropriateness of the item formats and the ease of responding to the items;
- Clarity of the instructions to complete each section of the questionnaire;
- Ease of navigation throughout the questionnaire; and
- Level of engagement/interest in completing the survey.

Fifteen individuals participated in the pilot study, representing higher education, senior secondary education, further education and vocational education from Victoria, South Australia and New South Wales. Individuals were selected based upon the recommendations of both the research team and the AQF Council. Criteria for selection were based upon experience and expertise with:

- Qualification frameworks;
- Qualification Types;
- a range of educational sectors; and/or

- Survey design.

The pilot study occurred over three days. Overall, the findings were very positive in terms of the user-friendliness and functionalities of the on-line questionnaire. The findings were used to make further improvements to the questionnaire prior to data collection. A report on the pilot study has been included in Appendix 5.

Stage 3: Data Collection

3.1 The Target Population

The target population for the survey were individuals who used the AQF to develop, accredit, deliver or assess Australian senior secondary, vocational education and training or higher education qualifications. To ensure that there was adequate data across all Qualification Types, a sample size of at least 700 respondents was sought (i.e., 50 respondents per Qualification Type).

3.2 Data Collection Period

Data was collected using the on-line survey which was linked to the AQF Council's website. Data collection occurred across a five and half week period. Regular monitoring of participation rates for each Qualification Type was undertaken throughout the data collection period to identify Qualification Types that were at risk of not meeting the desired quota. In such instances, the AQF Council implemented targeted recruitment strategies with key personnel in each sector.

3.3 Recruitment Strategy

The recruitment of participants was the responsibility of the AQF Council. A link to the on-line survey was prominently placed on the AQF Council's website. In addition to the website, key stakeholder groups were sent promotional newsletters from the AQF Council on a regular basis both prior to and throughout the data collection period. Similar newsletters and invitations were sent to those who subscribed to the AQF Council's newsletter. The AQF Council also wrote letters to key stakeholders asking them to disseminate the information through their networks, newsletters and websites.

Stage 4: Data analysis

4.1 Item Response Theory

The AQF Council had four interests in the study for which Item Response Theory (IRT) analysis could provide useful information.

1. Levels – 10 sets of Levels Criteria were developed to describe increasing complexity of learning outcomes. The first purpose of using IRT was to empirically validate the ordered nature of the Levels and determine their positioning on the levels framework.
2. Qualification Type Descriptors – Each Qualification Type was described by a set of descriptors. The second purpose of using IRT was to empirically validate the complexity of the set of descriptors proposed for each Qualification Type.
3. Qualification Type complexity – Each Qualification Type was rated by multiple respondents. The third purpose of using IRT was to estimate the relative complexity of each Qualification Type.
4. Relationship between Qualification Types, Qualification Type Descriptors and Levels – The fourth purpose of using IRT was to examine the relationship between the complexity of each Qualification Type and how these related to the complexity of the sets of Qualification Type Descriptors. Furthermore, the relationship between the complexity of the sets of Qualification Type Descriptors and the 10 proposed levels was examined. Specifically, the analysis sought to empirically position each of the 14 sets of Qualification Type Descriptors on the same scale as the 10 sets of Levels Criteria.

The Levels Criteria and Qualification Type Descriptors have been collectively referred to as 'statements'. To report on the aims of the study, the two facets, the statements and Qualification Types needed to be rank ordered within themselves, and matched with each other. This is very similar to the situation where test items and students are ranked, and students' abilities are matched to the difficulties of the test items. More explicitly, the analogy is that the statements are similar to test items in a testing situation, and the Qualification Types are similar to students taking a test.

Item Response Theory (IRT) is a paradigm for the design, analysis, and scoring of tests, questionnaires, and similar instruments for measuring abilities, attitudes, or in this case, complexity of qualifications. It is based on the application of related mathematical models to testing data. IRT is the preferred method for the development of tests such as the National Assessment Project – Literacy and Numeracy (NAPLAN), the OECD Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS).

As IRT is suited to calibrating test items and students on the same scale, IRT is also a useful tool for calibrating the statements and the Qualification Types on the same scale. However, unlike students who typically can respond directly to test items, the Qualification Types cannot directly generate a response against the statements. A respondent is needed to apply

his/her professional judgement to rate the Qualification Types against such statements. This is similar to the rating of students in a performance task (e.g., writing or speaking in the language arts), where a teacher acts as a rater to generate item responses about a student's performance against a task. The respondents recruited in this study are acting as "raters" to provide their ratings of Qualification Types against the criteria and descriptor statements, based upon their professional judgement.

As the respondents' ratings of a Qualification Type may vary between respondents, in a similar way that markers of essays may differ a little in making subjective judgements of a piece of work, this study has recruited multiple respondents to rate each Qualification Type against multiple statements of criteria and descriptors. The ratings from all respondents for each Qualification Type are then aggregated to provide a more reliable measure for each Qualification Type. Similarly, each statement is rated not only by multiple respondents, but also rated against multiple Qualification Types, so that the statements can be calibrated with respect to each other and with respect to the Qualification Types.

In addition, the use of alternative questionnaire forms requires a process to pool the data together. Again, IRT provides a helpful tool for "equating" questionnaire forms when the respondents are presented with different sets of questions in alternative forms, provided that there are common items linking different questionnaire forms.

On a technical note, IRT uses a probability function to describe the likelihood that a respondent would give a particular rating to a Qualification Type against a particular statement. Through the use of the probability function, conclusions can be drawn about the relative standing of Qualification Types and the statements.

4.2 Developing Complexity Estimates

As described previously, respondents were asked to rate whether a particular statement was 'too low', 'at this level' or 'too high' in terms of the complexity of the learning outcomes expected of the selected Qualification Type.

For the purpose of analysis, respondents were considered 'raters' who were each responsible for rating the complexity of a Qualification Type (which was the qualification they nominated in the survey to form the focus of their responses). For each 'rating' of a Qualification Type against each statement, a 'score' of 2 was assigned to ratings of 'too low' indicating that the expected outcomes of the Qualification Type were more complex than that described by the statement that was rated. Conversely, a 'score' of zero (0) was assigned to ratings of 'too high' which indicated that the expected outcomes of the Qualification Type were less complex than that described by the statement that was being rated. A 'score' of 1 was assigned to ratings of 'at this level'. That is, a respondent taking a survey in effect was

providing a rating of complexity for their selected Qualification Type against the statements. The 'score' indicated how complex the Qualification Type was estimated to be. Higher scores indicated higher complexity of the Qualification Type (and conversely, low scores indicated low complexity).

The ratings not only provided information about the complexity of the Qualification Type being rated using the professional judgement of the respondent, but it also provided information about the relative differences in complexity of the various statements that were drawn from a range of levels and Qualification Types.

Using Item Response Theory, the complexity of the Qualification Type being rated could then be estimated as well as the relative difference in the complexity of the statements. Furthermore, the application of IRT to the data enabled all estimates of complexity to be mapped onto a single scale of measurement.

Standard Item Response Theory analyses were carried out using the ConQuest computer software program⁵. The survey design contained items that were common to multiple survey forms (e.g. some of the statements on Form A also appeared on Form B). This enabled all statements on Forms A to E to be mapped onto the same scale using common item equating.

The outcome of the analyses was that the complexity of each statement and each Qualification Type was estimated on a scale measured in logit units (analogous to the unit of measurement in centimetres on a ruler used to measure length).

A transformation was then applied to these estimates to make them more interpretable for the AQF stakeholders (similar to converting inches into centimetres). Statements were assigned a complexity estimate ranging from 100 (low complexity) to 200 (high complexity). A conceptual diagram depicting the relationship between statements and Qualification Types to determine estimates of complexity using IRT has been included in Appendix 10.

4.3 Discrimination Index

The discrimination index provides additional empirical information about the performance of the statement (in addition to the complexity estimate of the statement). Discrimination values are a measure of correlation and, as such, range in value from 0 to 1. Values tending towards zero (0) indicate that the statement(s) had very low, if any, discrimination, while values tending towards one (1) indicate that the statement(s) had high discrimination in separating Qualification Types of varying complexity. As such, a statement with higher discrimination is considered to be better than another statement with lower discrimination as

⁵Wu, M. L., Adams, R. J., Wilson, M. R. & Haldane, S. (2007). ConQuest (Version 2.0) [Computer Software]. Camberwell, Australia: ACER.

the statement with higher discrimination is better able to separate Qualification Types of varying complexity. In practice, a low discrimination value may indicate that the wording in a statement was unclear or ambiguous for respondents. In this study, statements that had a discrimination value less than 0.4 (hence relatively low in comparison to the other statements) were identified for possible further review by the AQF Council.

4.4 Identifying statements for review

The complexity estimates and discrimination index were used to identify statements for review. Complexity estimates of statements can be used to identify criteria/descriptors that were considerably higher or lower than the complexity of the Level/Qualification Type they were intended to describe. The discrimination of a statement provides additional information indicating 'how well' a statement is able to separate Qualification Types of varying complexity. Any statement that was either considerably higher or lower in complexity than expected as well as having relatively low discrimination values was strongly recommended for review.

In some cases it was possible that a statement had a low discrimination value but also had a complexity estimate that was generally as expected. Such statements may still be worth reviewing as, relatively speaking, they do not separate Qualification Types (in terms of varying levels of complexity) as well as other statements with higher discrimination. In other words, statements in this category could possibly be considered redundant or could be reviewed to improve their discrimination.

Alternatively, another scenario warranting review of a statement was any statement that had average/high discrimination but a considerably higher or lower than expected complexity estimate. These statements are good at separating Qualification Types of varying complexity. However, the discrepancy between expected and observed complexity indicates that these statements may potentially be better used to describe different Levels/Qualification Types than those originally intended.

Results

This section of the report presents the findings from the analyses. First the background characteristics of the sample are described, secondly, the perceived appropriateness of notional duration of student learning is explored; thirdly, the results from the item response theory analysis are presented in which the complexity estimates and discrimination values of the Levels Criteria and Qualification Type Descriptors are presented; and finally, the relationship between the levels and Qualification Types is examined.

1. The Sample

Seven hundred and eighty-eight (788) respondents submitted completed surveys which were retained for analysis. Approximately 800 additional records were excluded from analysis because they were only partially complete (i.e. those respondents that did not make it all the way through to the end of the survey were excluded from analysis). Each of the 788 respondents completed either Form A, B, C, D or E. The breakdown of the number of respondents per form has been displayed in Table IV.

Table IV : Number of respondents per form

Form	Frequency	Percent
A	223	28
B	186	24
C	95	12
D	86	11
E	198	25
Total	788	100

Figure 3 is a bar chart that displays the location of the 788 respondents according to each state/territory within Australia. The figure presents percentages (%) and the number of respondents (n) for each location. The majority of respondents were from New South Wales and Victoria (29% and 27%, respectively). Very few respondents were located in the Northern Territory (1%), Tasmania (1%) and the Australian Capital Territory (4%).

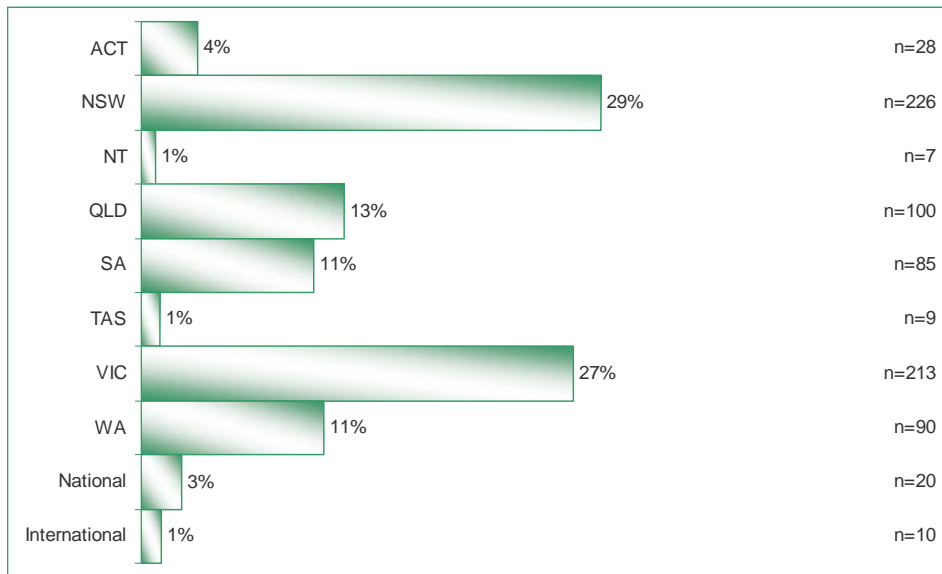


Figure 3: Location of respondents

The respondents were also required to indicate their role. Figure 4 displays the percentage (%) of respondents as well as the number of respondents (n) who selected each role category.

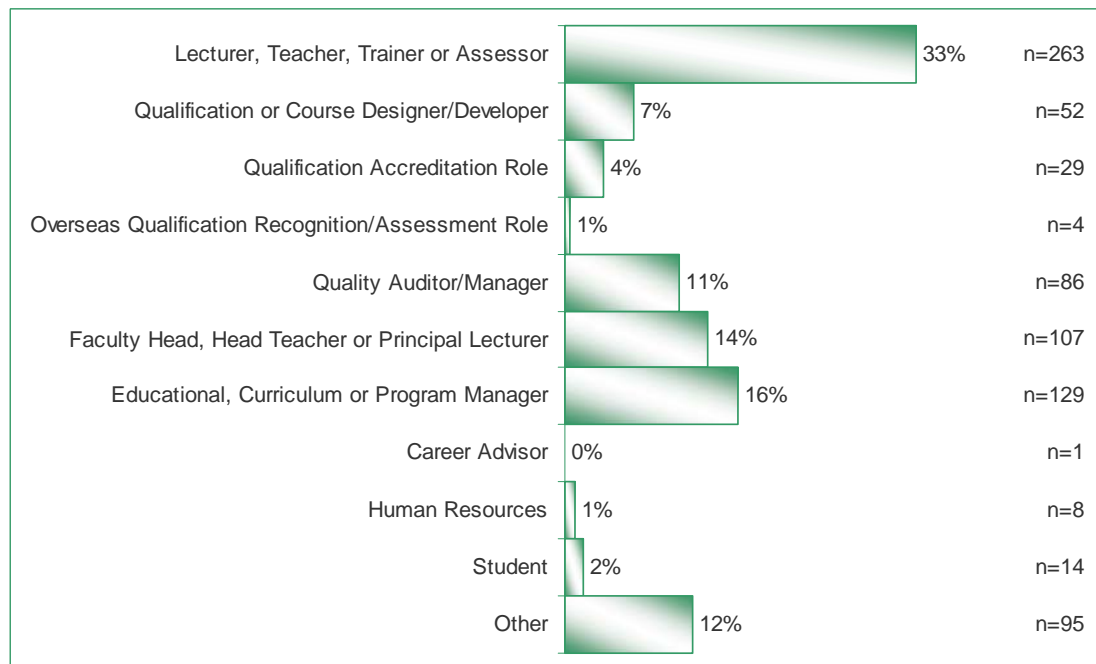


Figure 4: Role of the respondent

It can be seen that of the 788 respondents, the majority were lecturers, teachers, trainers or assessors (33%), followed by educational, curriculum or program managers (16%) and faculty heads, head teacher and/or principal lecturers (14%). Twelve percent of the respondents specified that their role was outside of those listed on the survey. The specific roles identified by these respondents can be found in Appendix 7. Examples cited included

Associate Deans, RTO managers and College Directors. Of those 95 respondents who selected “other”, the majority tended to be from Higher Education or industry. It is interesting to note that a number of people within the VET sector who selected ‘other’ supplied role titles that could have been classified under the listed sub-categories (e.g., College Assessor, Course Coordinator).

Figure 5 displays the educational sector representation of the sample. It can be seen that the sample represented all educational sectors with the majority of respondents from the VET sector (52%), followed closely by the Higher Education sector (39%). Less than 5% of the sample represented the senior secondary education sector (4%). Of the 38 respondents (i.e., 5% of the sample) who indicated that they were from outside these three sectors, 35 indicated that they were from Adult and Community Education, whilst the remaining three were from ELICOS.

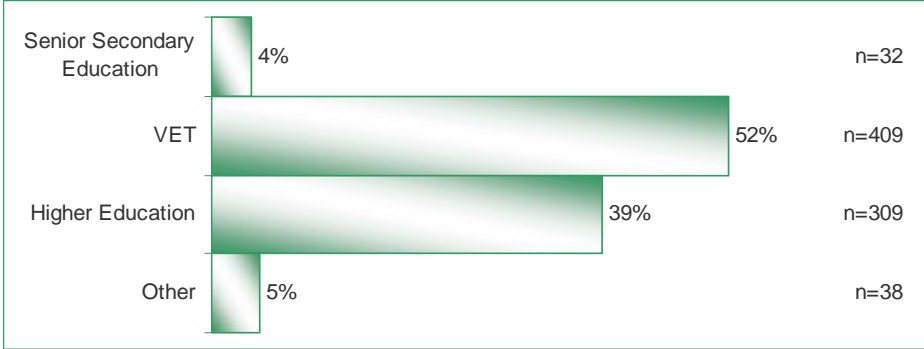


Figure 5: Educational Sector Representation

Although a minimum of 50 respondents per Qualification Type was the desired sample size, some Qualification Types did not meet this quota, while others exceeded it. Figure 6 displays the percentage of respondents for each of the 14 Qualification Types (and 2 Kinds).

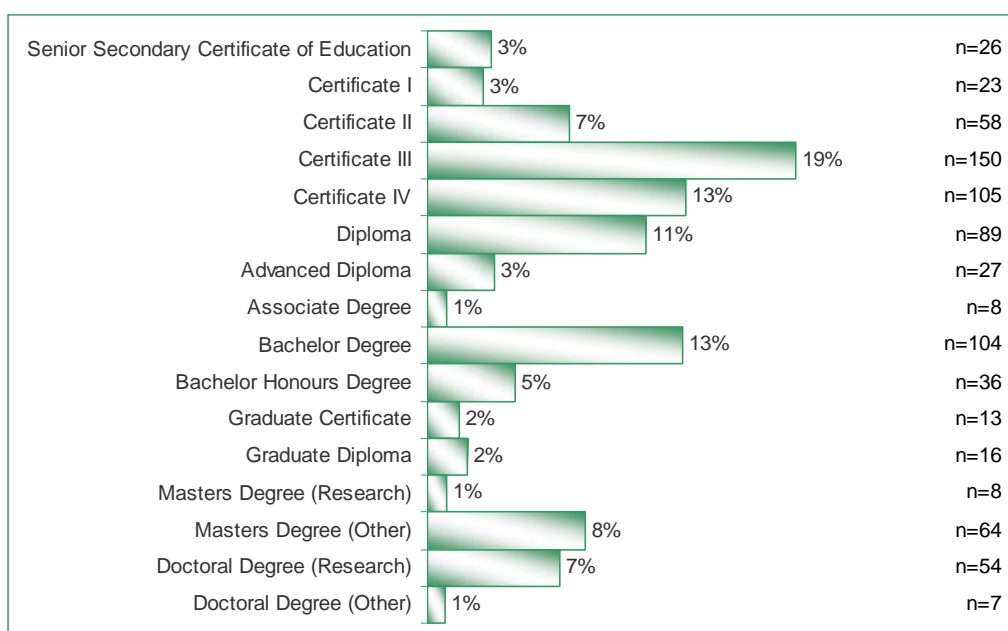


Figure 6: Qualification Type Selected

It can be seen that the quota was reached for 7 of the 14 Qualification Types, namely the Certificate II, Certificate III, Certificate IV, Diploma, Bachelor Degree, Master Degree (Other and Research combined) and Doctoral Degree (Other and Research combined).

As mentioned in the methodology, each form comprised statements drawn from a range of Qualification Types and Levels. Table V displays the minimum number of respondents rating the set of descriptors for each Qualification Type.

Table V: Minimum number of respondents rating the set of descriptors for each Qualification Type.

Qualification Type Descriptor Set	Minimum number of respondents
Senior Secondary Certificate of Education	409
Certificate I	223
Certificate II	223
Certificate III	409
Certificate IV	409
Diploma	281
Advanced Diploma	181
Associate Degree	181
Bachelor Degree	181
Bachelor Honours Degree	284
Graduate Certificate/Graduate Diploma	284
Masters Degree (Research and Other)	198
Doctoral Degree (Research and Other)	198

For example, the Senior Secondary Certificate of Education had 8 Descriptors that were rated by at least 409 respondents. This is because this set of descriptors was presented in Form A and Form B, which were rated by those respondents that selected the Certificate I,

Certificate II, Certificate III, Certificate IV, the Senior Secondary Certificate and Diploma. Please note that forms B and C were randomly presented for the Diploma and therefore, not all those who rated the Diploma necessarily reviewed those descriptors from within the Senior Secondary Certificate of Education.

For several of the Qualification Types, respondents were then asked further questions about the Qualification Type. For example, respondents that chose Certificate I were then asked to indicate whether that was an accredited qualification and/or Training Package qualification. Respondents were able to select more than one option and therefore the sum of the sub-category responses does not necessarily equal the total number of respondents per Qualification Type. For example, 58 respondents selected Certificate II. Of these respondents, 24 indicated that it was an Accredited qualification while 48 indicated that it was a Training package qualification. Therefore, at least some of the Certificate II respondents selected both options which may indicate that some respondents were uncertain of the distinction between these terms. A summary of the qualification sub-category questions has been provided in Table VI.

Table VI : Qualification Types sub-categories.

Qualification Title	Qualification total number of respondents	Qualification Category	Number of respondents for each category
Certificate I	23	Accredited qualification	15
		Training package qualification	9
Certificate II	58	Accredited qualification	24
		Training package qualification	48
Certificate III	150	Accredited qualification	44
		Training package qualification	106
		Trade - Apprenticeship	69
		Non trade	15
Certificate IV	105	Accredited qualification	38
		Training package qualification	90
		Trade - Apprenticeship	6
		Non trade	9
		Entry level ⁶	4
		Specialisation ⁷	6
Diploma	89	VET accredited qualification	40
		Training package qualification	60
		HE accredited qualification	6
		Entry level	3
		Specialisation	4
Advanced Diploma	27	VET accredited qualification	13
		Training package qualification	12
		HE accredited qualification	7
		Entry level	0
		Specialisation	8
Graduate Certificate	13	VET accredited qualification	7
		HE accredited qualification	7
Graduate Diploma	16	VET accredited qualification	1
		HE accredited qualification	16

Respondents were also requested to state the full title of the qualification that would form the focus of their thoughts and answers to the questionnaire. As can be seen in Appendix 6, there was a large range of qualifications rated. Respondents were also asked to indicate the main field of study for the qualification selected. These findings have been presented in Figure 7. It can be seen that the 788 qualifications selected for this study represented all 12 ASCED fields, with the majority of qualifications being in the fields of education; engineering and related technologies; and management and commerce.

⁶ Entry level meaning longer duration qualification for entry to an occupation or profession

⁷ Specialisation meaning shorter duration specialist qualification that builds on skills already acquired

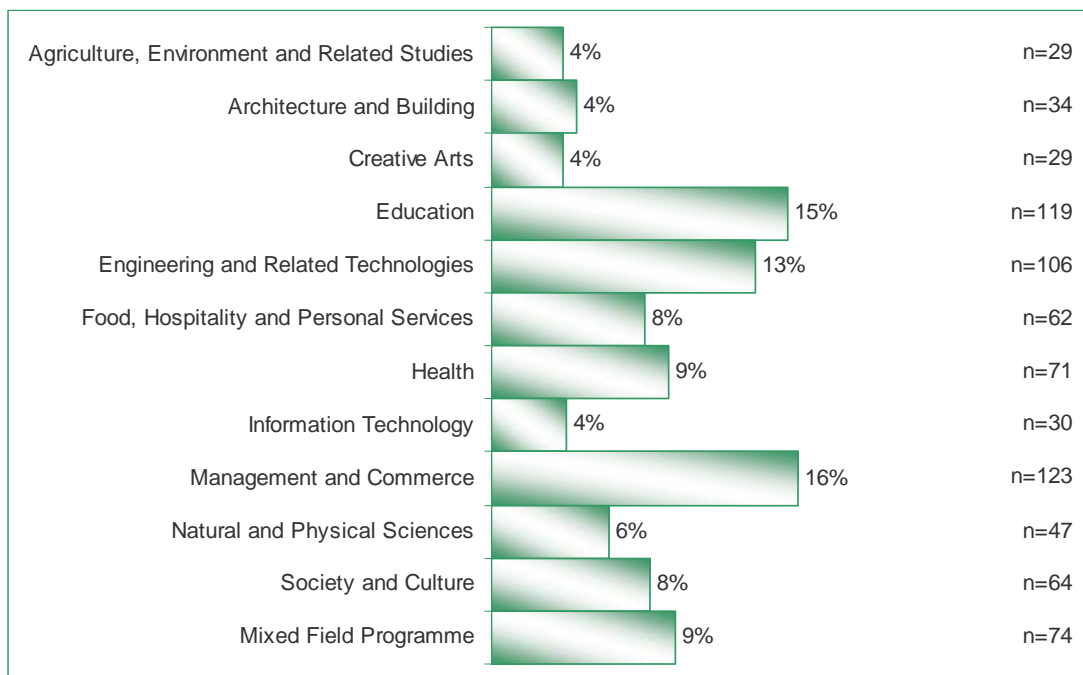


Figure 7: Main field of study

2. The Notional Duration of Student Learning

Each Qualification Type had a proposed notional duration of student learning time frame (refer to Appendix 1). Depending on the Qualification Type selected, the respondents were required to indicate the extent to which s/he agreed to the time frame using a four point rating scale (strongly agree to strongly disagree). ***Of the 788 respondents surveyed, 76% either agreed or strongly agreed with the time frame specified.***

Figure 8 displays the level of agreement for each Qualification Type. Note that within this graph, the percentage of agreement represents those who either strongly agreed or agreed to the statement. Similarly, the percentage of disagreement represents those who disagreed or strongly disagreed to the notional duration of student learning.

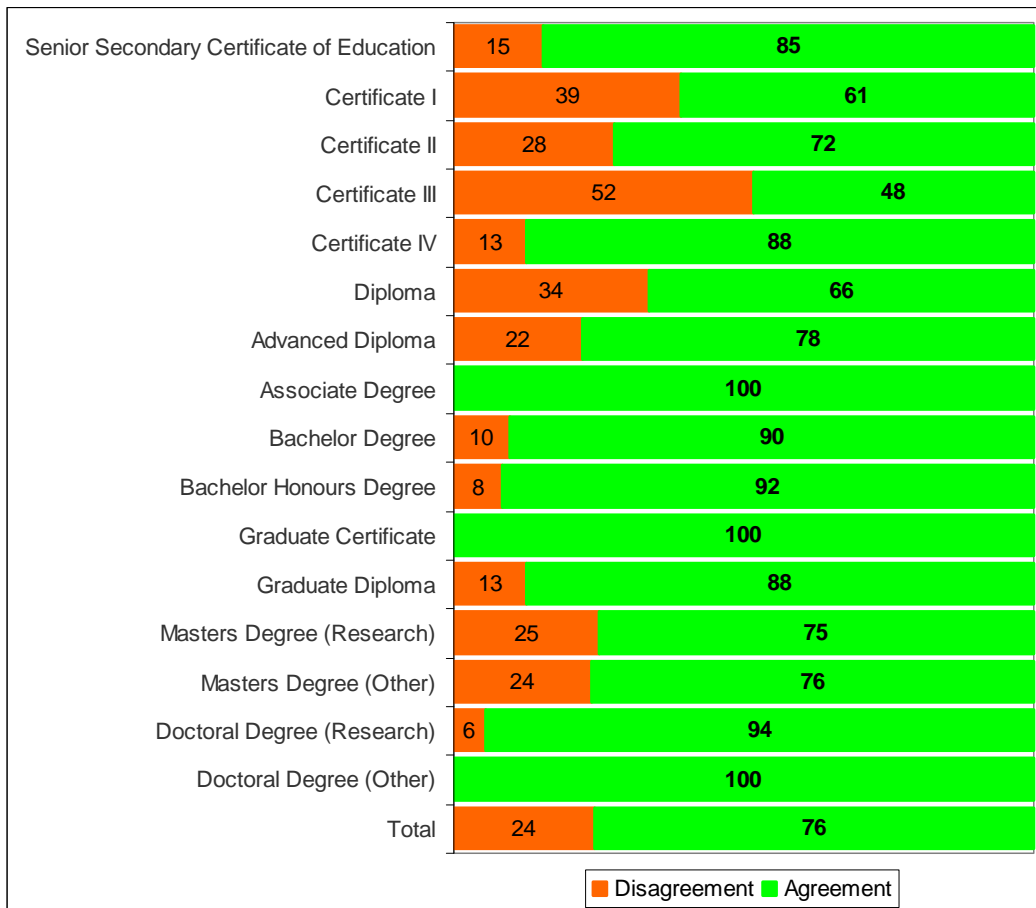


Figure 8: Percentage of Respondents who agreed or disagreed to the Notional Duration of Student Learning by Qualification Type.

With the exception of Certificate III, it can be seen that the majority of respondents either agreed or strongly agreed to the notional duration of student learning time specified for the Qualification Type selected.

One hundred and fifty (150) respondents selected Certificate III to form the focus of their responses to the survey. ***The tendency for respondents to disagree with the 1 - 2 years notional duration of student learning for Certificate III appeared to be slightly higher when the qualification was classified as a trade-apprenticeship***, as depicted in Figure 9.

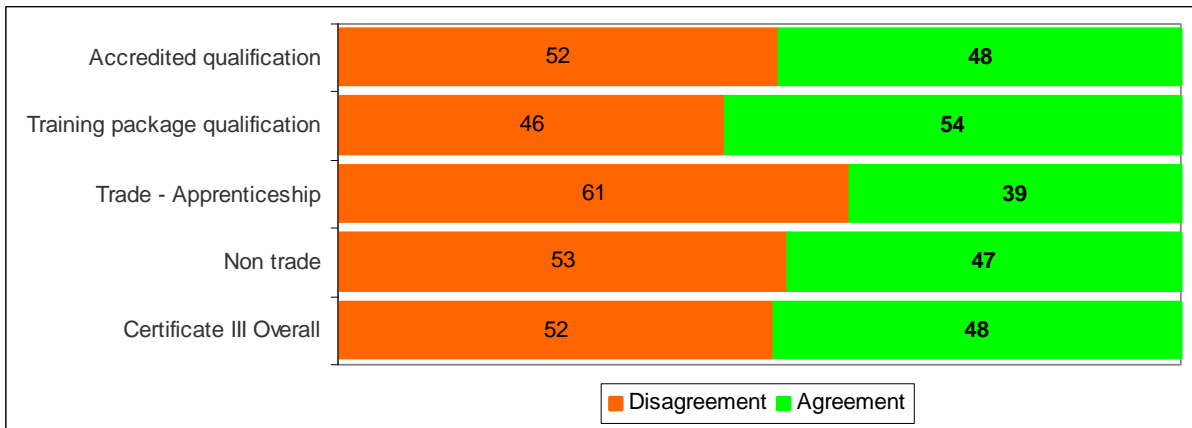


Figure 9: Percentage of agreement according to the Certificate III breakdown

Respondents who disagreed with the notional duration of student learning were asked to provide feedback on why they chose to disagree. Of the 190 respondents who disagreed with the timeframe, 188 provided qualitative feedback as to the reason why (refer to Appendix 8 for a full copy of the feedback received). Seventy-five of those 188 respondents (i.e., 40%) were in relation to the Certificate III. It is interesting to note that the **feedback from the Certificate III respondents was contradictory**. Some were of the opinion that the minimum duration of student learning for Certificate III was too long, while others thought it was too short. For example, those who argued that the timeframe was too long argued:

“Certificate III is an entry level qualification to gain employment in the industry. A full-time employee should be able to gain this qualification within 12 months and a full time student within 6 months including practicum component. Alternatively less than this - competence is dubious.”

VET - Quality Auditor/Manager, Cert III

Most level 3 qualifications are completed in less than one year.

VET - Quality Auditor/Manager, Cert III

Whist others, particularly those associated with trade qualifications, argued that three years should be the minimum. Examples include:

“The Certificates have already by the previous changes been “dumbed down”. Further reductions in time will result in poorly skilled tradespeople in the industry because the content will have to be reduced to fit into the reduced time available.”

VET - Lecturer, Teacher, Trainer or Assessor, Cert III

“To gain the depth of understanding with on the job application for this qualification it needs to be 3 years in duration (at least).”

VET - Educational, Curriculum or Program Manager, Cert III

“The electrical trade qualification has a significant depth and breadth of knowledge that is required for today’s electricians. The qualification leads to an electrical licence which has implications for public safety. The on-the-job component of the training is monitored rigorously and requires at least three years of work experience at 4 days a week. The off-the-job training is technically difficult. The

issue is that trade Certificate IIIs are different from non-trade Certificate IIIs and require a distinct classification.”

VET - Faculty Head, Head Teacher or Principal Lecturer, Cert III

“Certificate III has been equated with the traditional trades such as Carpentry, plumber, mechanic etc. These were all 4 year trades and to equate a 1 year (or less) Cert III qualification such as concreter, business admin etc with them not only de-values those traditional trades but falsely misrepresents the newer training packages.”

VET - Human Resources, Cert III

A small number of people within the VET Sector also argued against the concept of a notional duration of student learning within the AQF. For example,

“Notional duration has no place in a competency based system. There should be a system to measure volume of learning, not create arbitrary lengths of study.”

VET - Other Role, Cert III

“Competency is competency and can take longer or shorter dependant on student - also work experience and RPL opportunities.”

VET - Quality Auditor/Manager, Cert III

“VET is competency based and should therefore not have any notional duration. Every year we have a group of very capable students completing a Diploma in 1 year.”

VET - Educational, Curriculum or Program Manager, Diploma

A small number of people in higher education also raised concerns with the use of ‘years’ as a measure of duration. For example,

“Completing a minimum level of study by time is not appropriate, rather units of study completed should be the requirement.”

Higher Education - Student, Master Degree (Other)

“It is difficult to measure a degree in ‘years’ since this does not reflect the different lengths of sessions nor the number of sessions per year. For example, the same time spent learning could be over 2 years (4 semesters - 2 per year), or could be over 1 year (4 quarters).”

Higher Education - Faculty Head, Head Teacher or Principal Lecturer, Master Degree (Other)

Overall however, the majority of respondents (i.e., 76%) were in favour of the notional duration of student learning associated with the Qualification Type.

3. Item Response Theory Results

Both the Levels Criteria and the Qualification Type Descriptors were calibrated onto a single scale using IRT (see Methodology Stage 4: Data Analysis). Overall, the statements range in complexity from a minimum of 100 (i.e., lowest complexity statement) to a maximum of 200 (i.e., highest complexity statement). Table VII contains the complexity estimate and discrimination values for each of the 50 Levels Criteria. Similarly, Table VIII displays the complexity estimates and discrimination values for each of the 109 Qualification Type Descriptors. In both tables, column 'N' refers to the number of respondents that rated that statement. Each statement has been represented by its Code (see Appendix 2).

Table VII: Complexity Estimates and Discrimination Values for the Levels Criteria.

Level	Code	N	Discrimination	Complexity Estimate
Level 1	L001A1	223	0.64	125.1
	L001K1	223	0.50	111.5
	L001S1	223	0.46	102.6
	L001S2	223	0.49	117.8
Level 2	L002A1	223	0.62	126.6
	L002K1	223	0.56	109.4
	L002S1	223	0.51	108.2
	L002S2	223	0.62	112.8
Level 3	L003A1	409	0.54	126.3
	L003K1	409	0.56	123.5
	L003S1	409	0.59	131.8
	L003S2	409	0.61	149.3
Level 4	L004A1	504	0.51	131.1
	L004K1	504	0.58	148.4
	L004S1	504	0.51	139.1
	L004S2	504	0.54	152.0
Level 5	L005A1	281	0.55	143.3
	L005K1	281	0.50	152.8
	L005S1	281	0.49	144.4
	L005S2	281	0.51	158.7
	L005S3	281	0.58	152.4
Level 6	L006A1	181	0.54	146.2
	L006A2	181	0.46	155.9
	L006K1	181	0.40	152.1
	L006S1	181	0.51	152.4
	L006S2	181	0.52	164.9
	L006S3	181	0.45	152.4
Level 7	L007A1	181	0.59	161.0
	L007A2	181	0.35	143.3
	L007A3	181	0.56	159.3
	L007K1	181	0.47	149.3
	L007S1	181	0.45	148.2
	L007S2	181	0.51	165.5
Level 8	L007S3	181	0.44	143.6
	L008A1	284	0.50	162.1
	L008A2	284	0.37	157.4
	L008K1	284	0.52	164.4
	L008S1	284	0.46	162.7
	L008S2	284	0.44	175.6
Level 9	L008S3	284	0.45	155.4
	L009A1	198	0.53	184.2
	L009K1	198	0.46	149.1
	L009S1	198	0.58	177.7
	L009S2	198	0.63	179.9
	L009S3	198	0.56	182.2
Level 10	L010A1	198	0.50	183.8
	L010K1	198	0.44	171.9
	L010S1	198	0.62	185.8
	L010S2⁸	198	0.65	200.0
	L010S3	198	0.55	190.5

⁸ L010S2 was the most complex statement with a complexity estimate of 200.

Table VIII: Complexity Estimates and Discrimination Values for the Qualification Type Descriptors

Qualification Type	Code	N	Discrimination	Complexity Estimate	Qualification Type	Code	N	Discrimination	Complexity Estimate	Qualification Type	Code	N	Discrimination	Complexity Estimate
Senior Secondary Certificate of Education	QSSCK1	409	0.54	127.9	Diploma	QDIPK1	281	0.48	154.9	Graduate Certificate & Graduate Diploma	QGCTK1	284	0.50	166.1
	QSSCS1	409	0.56	145.9		QDIPS1	281	0.52	146.9		QGCTS1*	284	0.60	162.9
	QSSCS2	409	0.63	133.8		QDIPS2	281	0.61	164.1		QGCTS2*	284	0.58	167.6
	QSSCS3	409	0.56	149.8		QDIPS3	281	0.47	131.8		QGCTS3*	284	0.60	164.2
	QSSCS4	409	0.51	124.3		QDIPS4	281	0.47	128.3		QGCTS4*	284	0.46	140.9
	QSSCA1	409	0.62	141.1		QDIPA1	281	0.54	137.5		QGCTA1*	284	0.60	169.4
	QSSCA2	409	0.51	140.4		QDIPA2	281	0.58	149.5		QGCTA2*	284	0.55	163.1
	QSSCA3	409	0.54	129.3		QDIPA3	281	0.56	157.0		QGCTA3*	284	0.45	155.5
	QCT1K1⁹	223	0.38	100.0	QDIPA4	281	0.57	157.6	QGDPK1	284	0.56	171.8		
Certificate I	QCT1S1	223	0.39	100.2	Advanced Diploma	QADPK1	181	0.57	150.1	Master Degree (Other & Research kinds)	QMDOS4*	198	0.58	146.0
	QCT1S2	223	0.53	109.7		QADPS1	181	0.49	155.5		QMDOS5	198	0.64	174.0
	QCT1S3	223	0.58	114.4		QADPS2	181	0.56	151.8		QMDOA1*	198	0.50	152.9
	QCT1A1	223	0.70	129.0		QADPS3	181	0.55	157.0		QMDOA3	198	0.62	156.3
	QCT1A2	223	0.58	129.7		QADPS4	181	0.57	168.3		QMDRK1*	198	0.44	151.8
Certificate II	QCT2K1	223	0.56	106.1	QADPA1	181	0.50	138.6	QMDRK2		198	0.69	177.6	
	QCT2S1	223	0.64	127.6	QADPA2	181	0.61	157.1	QMDRS1*		198	0.53	162.2	
	QCT2S2	223	0.60	114.1	QADPA3	181	0.54	162.2	QMDRS2*		198	0.44	169.5	
	QCT2S3	223	0.53	105.7	QADPA4	181	0.61	156.7	QMDRS3*		198	0.56	170.0	
	QCT2A1	223	0.63	135.5	Associate Degree	QASDK1	181	0.48	147.6		QMDRS5	198	0.62	160.9
	QCT2A2	223	0.64	116.9		QASDS1	181	0.37	147.3	QMDRS6	198	0.60	180.6	
	QCT2A3	223	0.69	131.0		QASDS2	181	0.47	145.0	QMDRA2*	198	0.55	150.9	
QCT2A4	223	0.48	115.8	QASDS3		181	0.51	144.0	QMDRA3	198	0.66	180.2		
Certificate III	QCT3K1	409	0.54	130.9		QASDA1	181	0.34	129.3	Doctoral Degree (Other & Research kinds)	QDDOA3	198	0.63	163.8
	QCT3S1	409	0.52	129.1	QASDA2*	379	0.46	154.2	QDDOS2		198	0.61	177.2	
	QCT3S2	409	0.61	137.6	Bachelor Degree	QBADK1	181	0.38	150.6		QDDRK1*	198	0.66	188.5
	QCT3S3	409	0.62	148.4		QBADS1	181	0.42	155.4		QDDRK2	198	0.71	169.2
	QCT3S4	409	0.60	135.0		QBADS2*	379	0.47	153.6		QDDRS1	198	0.44	164.3
	QCT3A1	409	0.61	144.9		QBADS3	181	0.45	141.1		QDDRS2	198	0.57	178.9
	QCT3A2	409	0.60	129.1		QBADS4*	379	0.52	166.1		QDDRS4*	198	0.63	185.4
	QCT3A3	409	0.58	125.9	QBADS5*	379	0.43	142.4	QDDRS5*		198	0.57	159.1	
Certificate IV	QCT4K1	504	0.56	149.5	QBADA1	181	0.56	154.2	QDDRS6		198	0.59	186.9	
	QCT4S1	504	0.58	141.3	Bachelor Degree Honours	QBAHK1	284	0.45	162.1		QDDRA1*	198	0.47	149.5
	QCT4S2	504	0.64	150.4		QBAHS1	284	0.44	147.5	QDDRA2*	198	0.39	148.9	
	QCT4S3	504	0.54	138.0		QBAHS3	284	0.53	151.2	QDDRA3	198	0.59	178.8	
	QCT4S4	504	0.62	148.7		QBAHS5	284	0.58	152.9					
	QCT4A1	504	0.60	143.9		QBAHA1	284	0.54	146.6					
	QCT4A2	504	0.59	136.4	QBAHA3	284	0.53	159.3						
	QCT4A3	504	0.56	133.5										

⁹ QCT1K1 was the least complex statement with a complexity estimate of 100.

Note: * refers to a duplicate statement. That is, this descriptor was common to at least one other Qualification Type (refer to Appendix 2).

As shown in column 'N' of Table VII and Table VIII, ***the number of ratings made per statement ranged from 188 to 504***. For example, L001S1 from the Levels Criteria was rated by 223 respondents and had a very low complexity estimate of 102.6 and a discrimination of 0.46. In comparison, L003S1 was rated by 409 respondents, had a complexity estimate of 131.8 and a discrimination of 0.59 indicating that this statement was higher in complexity as well as more discriminating than the Level Criterion L001S1.

As with the Levels Criteria, the Qualification Type Descriptors can be directly compared in terms of complexity. For example, QADPA1 was rated by 181 respondents and had a complexity estimate of 138.6 and a discrimination of 0.50. Whereas QCT3A1 was rated by 409 respondents and had a complexity estimate of 144.9, with a discrimination of 0.61 indicating that this statement (from the set of descriptors for Certificate III) was higher in complexity than QADPA1 (from the set of descriptors within the Advanced Diploma) which was not expected. In addition to being more complex, QCT3A1 was also more discriminating than QADPA1.

As the statements were calibrated onto a single scale using IRT, comparisons can also be made between the complexity estimates and discrimination values of the Levels Criteria and Qualification Type Descriptors. That is, the values contained within Table VII can be directly compared to those contained within Table VIII. For example, L010S2 was the most complex statement with a complexity estimate of 200 (see Table VII) whilst QCT1K1 was the least complex statement with a complexity estimate of 100 (see Table VIII).

The following sections of the results explore in more detail the complexity estimates for the Levels Criteria and Qualification Type Descriptors. First, the Levels Criteria and Qualification Type Descriptors are each presented separately followed by an examination of their relationship to one another.

3.1 Levels Criteria

This section is based on the estimates presented in Table VII with summary statistics for the criteria within each level provided in Table IX. The average column indicates the average complexity of the criteria used to describe each level. Similarly, the minimum column indicates the minimum complexity of the criteria used to describe each level (and the maximum column indicates the maximum complexity). The range illustrates the difference between the maximum and minimum complexity estimates. For example, the criteria used to describe Level 4 (L004) have an average complexity 142.7. The complexity of the criteria for Level 4 had a range of 20.9 starting from a minimum of 131.1 up to a maximum of 152.

Table IX: Average Complexity Estimate and Range for each of the 10 Levels.

Level	Levels Criteria			Range (Maximum – Minimum)
	Average	Minimum	Maximum	
L001	114.3	102.6	125.1	22.5
L002	114.3	108.2	126.6	18.4
L003	132.7	123.5	149.3	25.8
L004	142.7	131.1	152.0	20.9
L005	150.3	143.3	158.7	15.4
L006	154.0	146.2	164.9	18.7
L007	152.9	143.3	165.5	22.2
L008	162.9	155.4	175.6	20.2
L009	174.6	149.1	184.2	35.1
L010	186.4	171.9	200.0	28.1

The estimates provided in Table IX have been graphically displayed in Figure 10. Note that the y-axis (complexity estimates) represents an interval measurement scale rather than a set of ordinal categories. Hence, a straight line relationship is not expected as you would if the y-axis represented the rank order of complexity. The results suggest, for example, that there is a large difference in complexity between Level 9 and Level 10 while the difference between Level 5 and Level 6 is much more subtle. Overall, it can be seen that the Levels Structure, as intended, is hierarchical and cumulative, covering a wide range of complexity. However, the graph reveals that there are some levels on the framework which may benefit from adjustments to the complexity of their criteria. For example, ***slightly increasing the complexity of the set of Levels Criteria for Level 2 and Level 7 would improve the gradual progression of complexity across the 10 levels.*** In addition, it may also be worth considering ***reducing the level of complexity for some of the Criteria within Level 1*** to more clearly show the progression of complexity from Level 1 to Level 2. Figure 10 also reveals that the increase in complexity is more gradual in the mid range levels (i.e., Levels 5 to 7), compared to the levels at the extreme end of the scale.

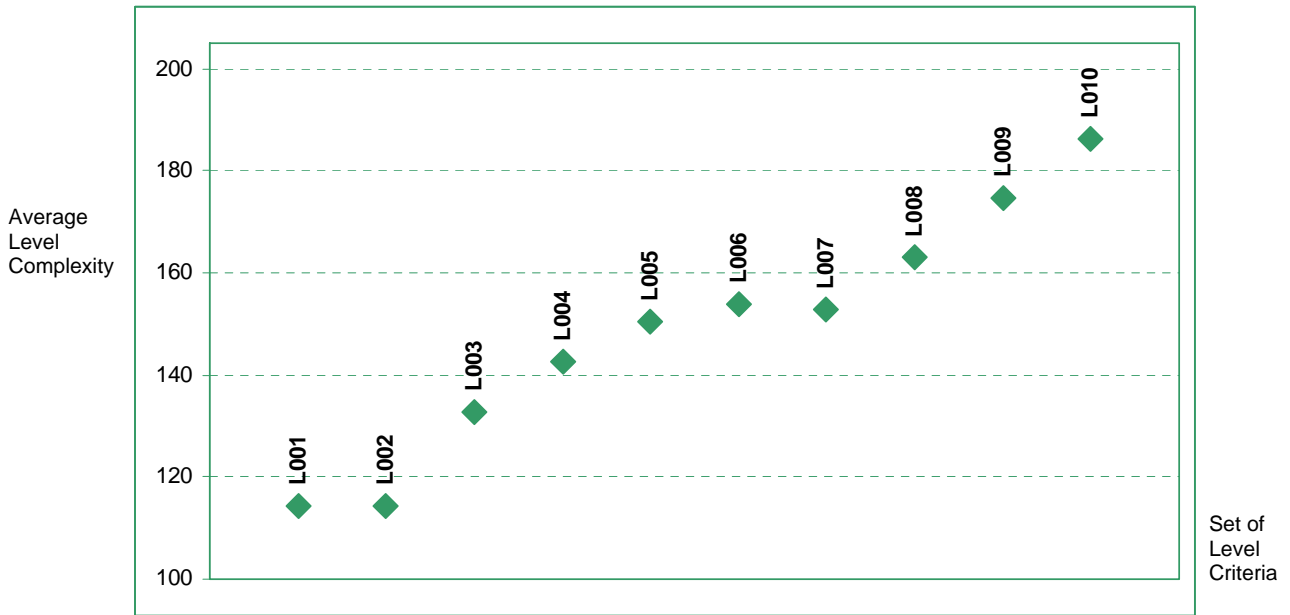


Figure 10: The Levels Structure: Average Complexity of the set of Levels Criteria

To further explore the Levels Structure and the positioning of each criterion on the proposed 10 Levels framework, the complexity estimates for each of the 50 criteria have been plotted in Figure 11 and grouped by level. The vertical (y) axis is the complexity scale ranging from 100 to 200. The horizontal (x) axis contains the 50 Levels Criteria that have been grouped according to the expected level on the Levels Structure (ranging from L001 to L010).

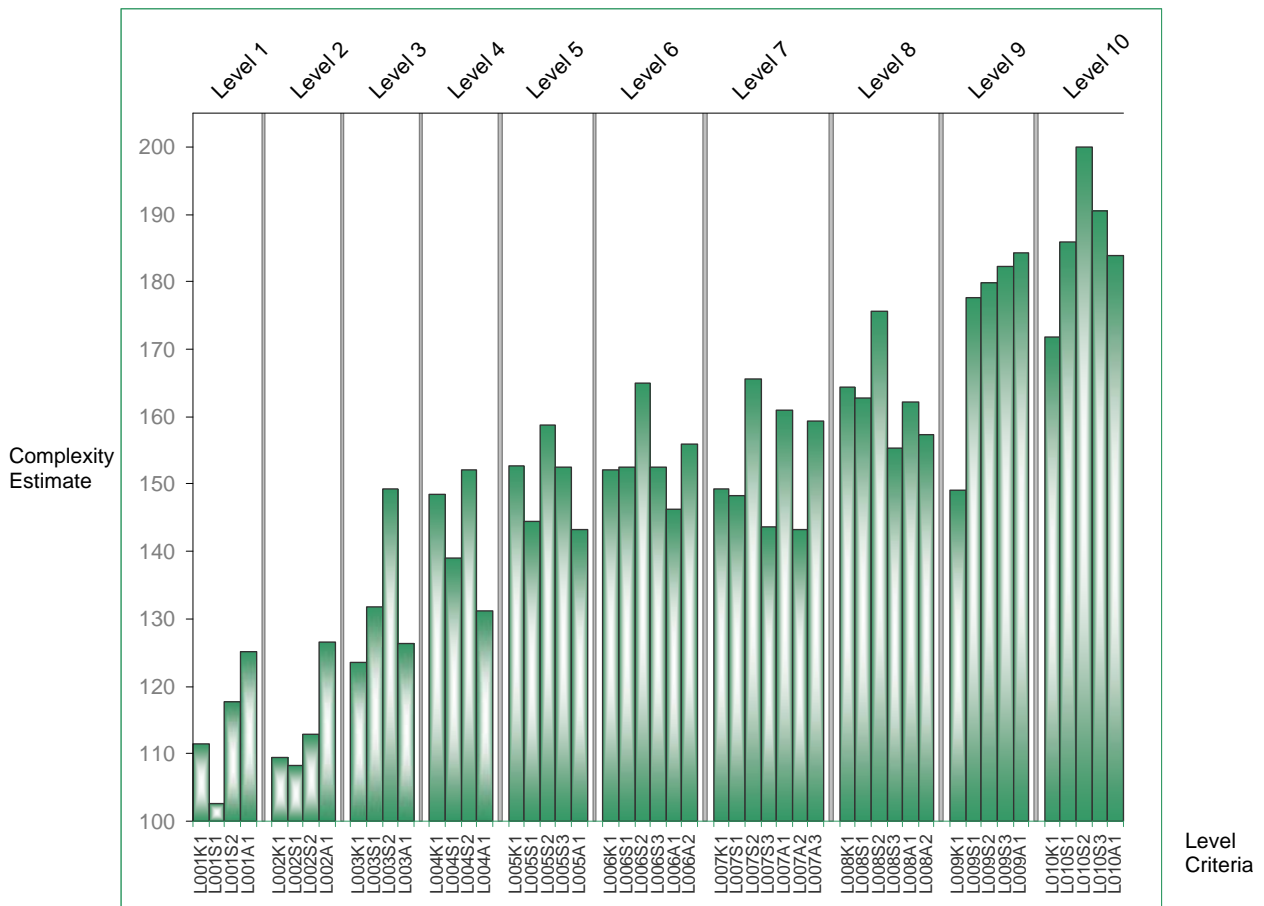


Figure 11: Complexity Estimates for each Levels Criterion

It can be seen that the Level Criterion L001S1 (i.e., Graduates at this level will have foundational cognitive, technical and communication skills to undertake defined routine activities) was the least complex criterion whilst L010S2 (i.e., Graduates at this level will have expert, specialised cognitive and technical skills in research and a discipline area to develop concepts and research methodologies that extend and redefine existing knowledge or professional practice) was the most complex criterion. Such findings are consistent with the proposed structure of the framework.

3.1.1 Dimensions and Levels Criteria

To further explore the impact of the dimensions on the estimates of complexity, the Levels Criteria complexity estimates have been plotted separately for each dimension.

Knowledge Dimension and Levels Criteria

Knowledge dimension criteria are shown in Figure 12 to highlight criteria within the Knowledge dimension that could possibly be reviewed to strengthen the hierarchical structure of the framework.

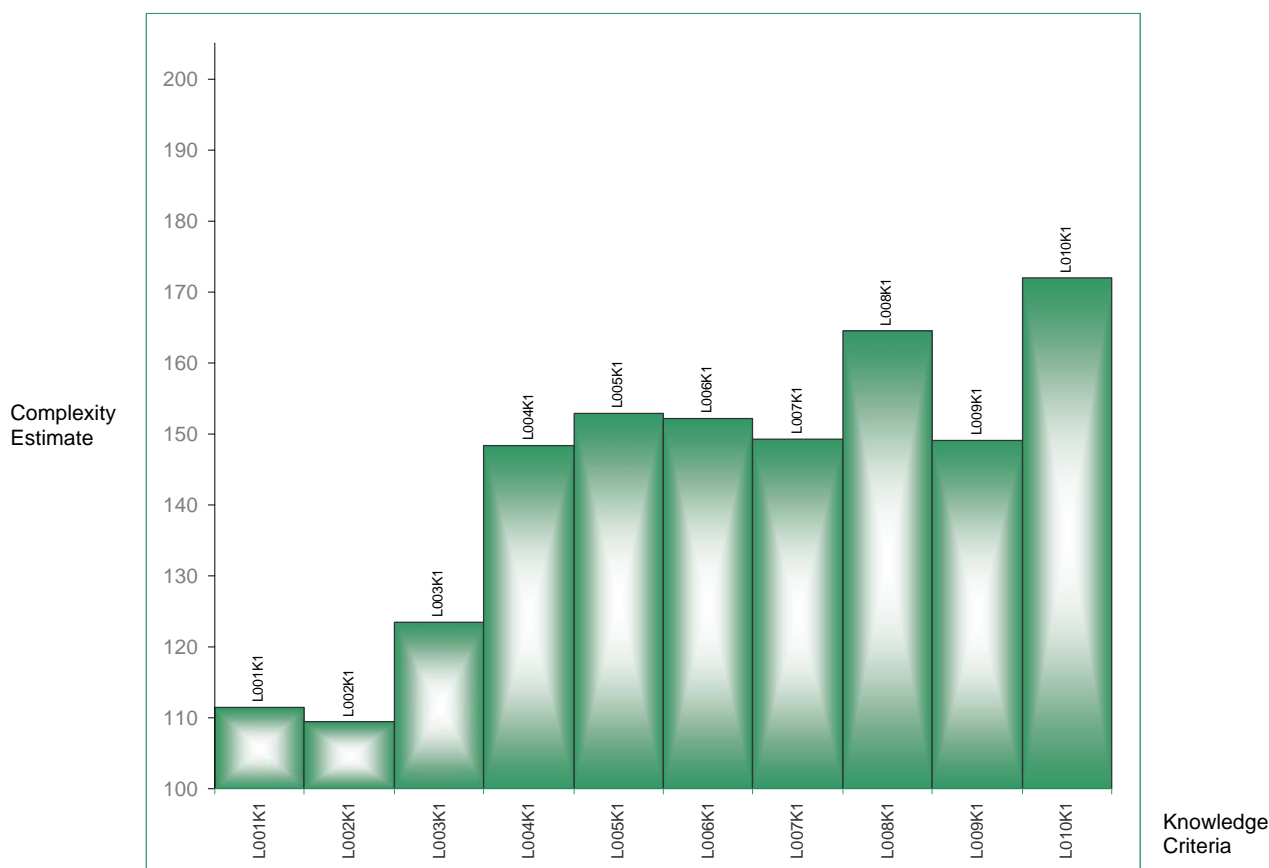


Figure 12: Complexity Estimates for Levels Criteria in the Knowledge Dimension

There were 10 Levels Criteria within the Knowledge Dimension with one criterion specified for each level. The complexity estimates for each criterion has been presented in Figure 12. As expected, the general trend shows Levels 1 & 2 criteria are low in complexity and Level 10 is high. However, the analyses showed that there was little, if any difference, in complexity between some of the statements. For example, ***the knowledge statements for Levels 1 and 2 have similar estimates of complexity***, despite the fact that their descriptions appear to be quite distinct. Each of these statements has been presented below, along with their complexity estimates and discrimination values.

Complexity Estimate	Discrimination Value	Code	Statement
112	0.50	L001K1	Graduates at this level will have foundational knowledge for life, further learning and preparation for work
109	0.56	L002K1	Graduates at this level will have basic factual, technical and procedural knowledge in a defined area of work and learning

Both criteria are discriminating well and have very similar complexity estimates but appear to have content unique to each statement. It is suggested that ***L002K1 be reviewed with the***

aim of increasing the complexity of the statement to increase the overall complexity of Level 2 criteria which, as mentioned previously, appears to be a lower than expected.

There are a range of possible solutions to increasing the complexity including refining the statement by rewording or adding terms, combining criteria with similar substantive meaning and complexity estimates or alternatively, providing a definition of some of the terms used (e.g. basic and foundation) in the glossary of terms.

Figure 12 also illustrates that the **Knowledge dimension appeared to flatten out from Level 5 to Level 7**, which may indicate that these criteria do not differ in complexity as much as desired. It also highlighted that the **Knowledge criterion for Level 9 was considerably less complex than expected**. The statements for Levels 5 to 10 are shown below, along with their complexity estimates and discrimination values.

Complexity Estimate	Discrimination Value	Code	Statement
153	0.50	L005K1	Graduates at this level will have a broad range of knowledge integrating theoretical concepts with depth in specialised areas of work and learning
152	0.40	L006K1	Graduates at this level will have comprehensive technical and theoretical knowledge of a specialised area or a broad field of work and learning
149	0.47	L007K1	Graduates at this level will have integrated technical and theoretical knowledge of a comprehensive area of work and learning
164	0.52	L008K1	Graduates at this level will have advanced technical and theoretical knowledge in a specialised area of work and/or learning
149	0.46	L009K1	Graduates at this level will have a systematic understanding of a complex body of knowledge in an area of work and/or learning
172	0.44	L010K1	Graduates at this level will have a systematic understanding of a substantial body of knowledge at the frontier of an area of work and/or learning

To improve the progression of complexity within the Knowledge Dimension, the AQF Council may want to consider:

- Whether it is possible to describe the intent of both L005K1 and L006K1 using a single criterion to span both levels 5 and 6 on the framework, particularly given that L006K1 is not discriminating as well as the other statements within the set.
- Rewording L007K1 to capture greater complexity of learning outcomes.
- It is possible that the complexity of L009K1 could be increased by simply adding the term “theoretical” to describe the body of knowledge and the term “specialised” to the area of work.

Please note that such a suggestion is provided for illustrative purposes only to demonstrate how the empirical findings can be used for qualitative purposes; as any changes to the wording would need to be undertaken in consultation with subject matter experts.

Skill Dimension and Levels Criteria

As with the Knowledge Dimension, the complexity estimates for the Skills Dimension have been displayed in Figure 13.

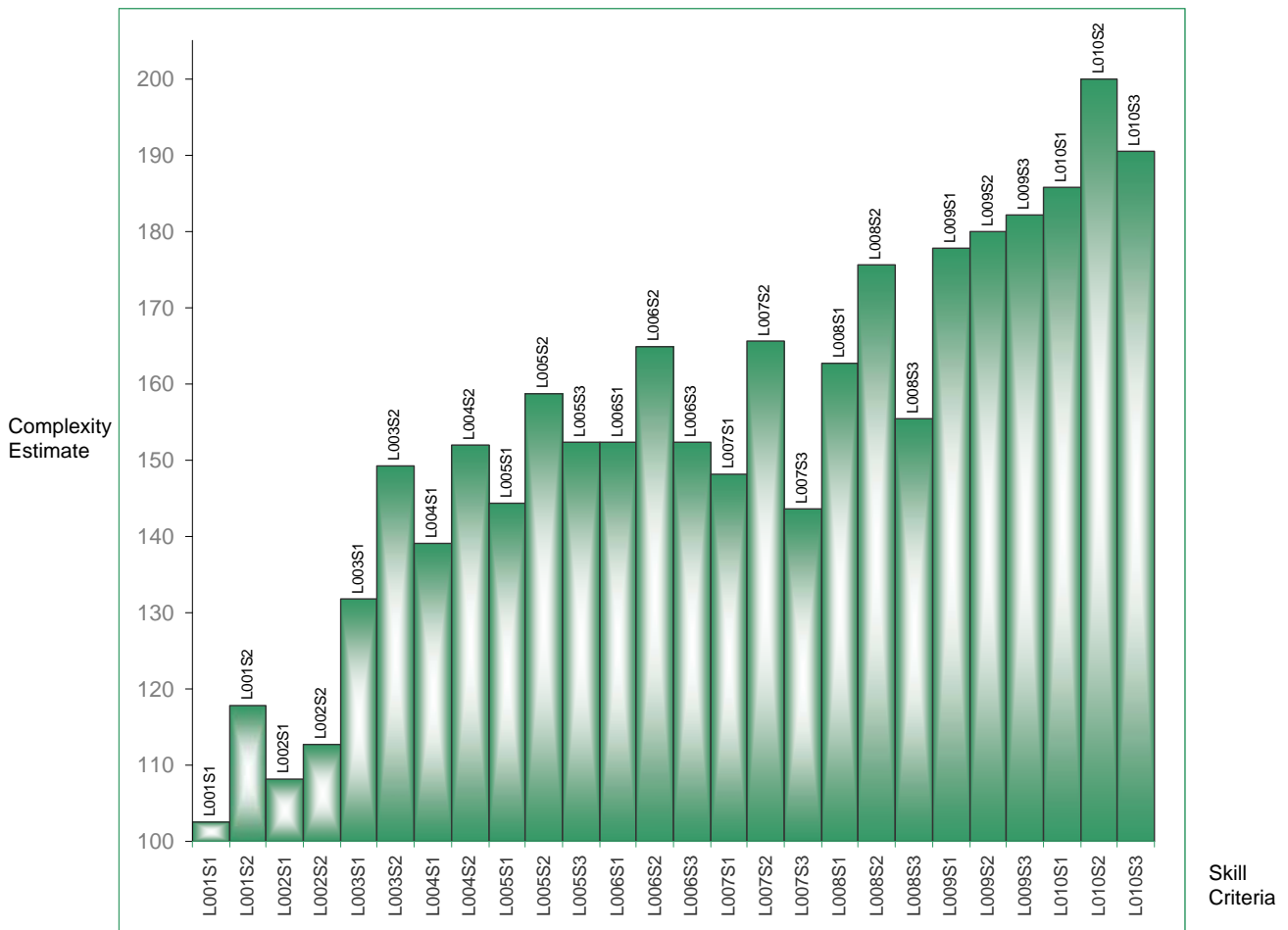


Figure 13: Complexity Estimates for Levels Criteria in the Skills Dimension

It can be seen overall that the Skills Dimension within the Levels Structure was also hierarchical and cumulative in that there was a general progression of increasing complexity across the scale. Figure 13 does however highlight a small number of criteria that could possibly be strengthened. For example, ***L001S2 was predicted to be at Level 1, yet it was found to be more complex than L002S1 and L002S2, suggesting that this criterion may be better aligned to Level 2.***

Complexity Estimate	Discrimination Value	Code	Statement
103	0.46	L001S1	Graduates at this level will have foundational cognitive, technical and communication skills to undertake defined routine activities
118	0.49	L001S2	Graduates at this level will have foundational cognitive, technical and communication skills to identify and report issues and problems
108	0.51	L002S1	Graduates at this level will have basic cognitive, technical and communication skills to apply appropriate methods, tools, materials and readily available information to undertake defined routine activities
113	0.62	L002S2	Graduates at this level will have basic cognitive, technical and communication skills to apply appropriate methods, tools, materials and readily available information to provide solutions to a limited range of predictable problems

Figure 13 also shows that there was a relatively sharp increase in the complexity of the skills criteria from Level 2 to Level 3, then a gradual increase up to Level 6, all within the expected direction. However, **the set of Skills Level Criteria for Level 7 appears to be a little low (i.e., is lower in complexity than expected), particularly L007S3 and L007S1. Similarly L008S3 might also be regarded as a little low.** The actual statements for these criteria have been presented below for illustration purposes.

Complexity Estimate	Discrimination Value	Code	Statement
148	0.45	L007S1	Graduates at this level will have well developed cognitive, technical and communication skills to select and apply methods and technologies to analyse and evaluate information to complete a range of activities
144	0.44	L007S3	Graduates at this level will have well developed cognitive, technical and communication skills to select and apply methods and technologies to transmit knowledge and ideas to others
155	0.45	L008S3	Graduates at this level will have specialised cognitive, technical and communication skills to select and apply methods and technologies to transmit knowledge and ideas to others

It is also interesting to note that the S2 criteria in all levels, except Level 9, were relatively more complex than the other statements within the same level. For example, L006S2 was more complex than L006S1 and L006S3.

Application Dimension and Levels Criteria

The positioning of the Levels Criteria within the Application Dimension was also examined. Figure 14 plots the complexity estimates for each of the 14 criteria.

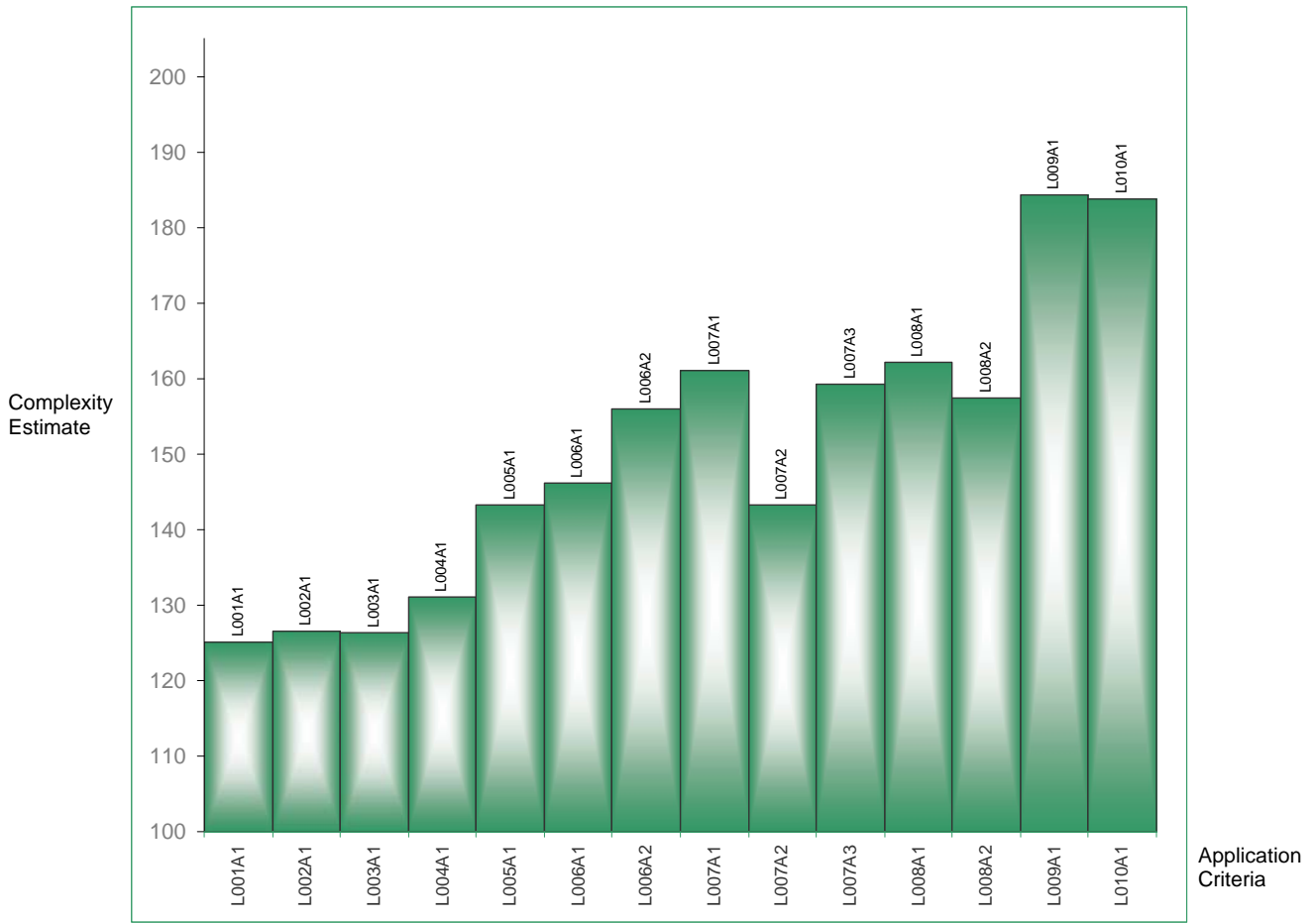


Figure 14: Complexity Estimates for Levels Criteria in the Application Dimension

In general, it can be seen in Figure 14 that the Application Dimension had varying levels of complexity with a gradual progression of increasing complexity from Level 3 to Level 7 (with the exception of L007A2).

It appears as though the increasing complexity of *the Application dimension could be improved if there were some minor amendments made to the criteria for Levels 1 to 3 which appear not to differ in complexity as much as desired*. Again, the descriptor statements have been presented below for illustrative purposes. It can be seen that all three criteria had good discrimination.

Complexity Estimate	Discrimination Value	Code	Statement
125	0.64	L001A1	Graduates at this level will apply knowledge and skills to demonstrate autonomy in structured and stable contexts and within established parameters
127	0.62	L002A1	Graduates at this level will apply knowledge and skills to demonstrate autonomy and judgement in structured and stable contexts and within established parameters
126	0.54	L003A1	Graduates at this level will apply knowledge and skills to demonstrate autonomy and judgement in known and stable contexts and within established parameters

Finally, it appeared as though the progression of complexity within this dimension could also be improved if **L007A2 was reworded to make it more complex and discriminating**. This statement was identified as having a relatively low discrimination (0.35) and, as such, we recommend this statement be reviewed or removed. For example, consideration may be given to rewording the phrase '*in contexts that require self-directed work and learning*' which may be considered lower in complexity than '*within broad parameters to provide specialist advice and functions*' as this phrase is included in statements L006A2 and L008A2 (included below for illustration purposes). It is also interesting to note that **L008A2 also had low discrimination (0.37) and a 'lower than expected' complexity estimate**, indicating that was not performing very well and should also be reviewed.

Complexity Estimate	Discrimination Value	Code	Statement
156	0.46	L006A2	Graduates at this level will apply knowledge and skills to demonstrate autonomy, judgement and defined responsibility <i>within broad parameters to provide specialist advice and functions</i>
143	0.35	L007A2	Graduates at this level will apply knowledge and skills to demonstrate autonomy, judgement and responsibility <i>in contexts that require self-directed work and learning</i>
157	0.37	L008A2	Graduates at this level will apply knowledge and skills to demonstrate autonomy, judgement and responsibility <i>within broad parameters to provide professional advice and functions</i>

3.2 Qualification Types

The following sections detail the results for the Qualification Types. First, the average complexity estimate of each Qualification Type is presented (referred to as the Qualification Type Complexity). This provides an indication of complexity for a Qualification Type in general (and may be considered to be an indication of current practice). Secondly, the complexity of the set of descriptors used to describe each Qualification Type is presented (referred to as Descriptor Complexity). The final part of this section examines the relationship between Qualification Type Complexity, Descriptor Complexity and Levels Complexity.

3.2.1 Qualification Type Complexity

Table X contains the Qualification Type Complexity estimates for each Qualification Type. It can be seen that ***the average complexity of the Qualification Types ranged from Certificate I (104.3) all the way up to the Doctoral Degree (175.1), indicating that the Qualification Types covered a wide range of complexity.***

Table X: Qualification Type Complexity

Qualification Type	Qualification Type Complexity
Senior Secondary Certificate of Education	131.7
Certificate I	104.3
Certificate II	114.9
Certificate III	134.9
Certificate IV	140.7
Diploma	148.1
Advanced Diploma	146.2
Associate Degree	131.2
Bachelor Degree	144.9
Bachelor Honours Degree	149.7
Graduate Certificate & Graduate Diploma	147.6
Masters Degree	156.3
Doctoral Degree	175.1

These estimates can be considered indicative of the complexity of the Qualification in current practice from the perspective of the respondents. However, the Qualification Type Complexity is not necessarily the same as the complexity of the set of descriptors used to describe each Qualification Type. To compare, Descriptor Complexity results are shown next followed by a discussion of how the descriptors match the results shown here.

3.2.2 Descriptor Complexity Summary Statistics

The average complexity of each set of descriptors is included in Table XI and also illustrated graphically in Figure 15. Table XI also includes the minimum and maximum complexity estimate for each set of descriptors and the range in complexity for each set. It can be seen that the Average Descriptor Complexity varied across Qualification Types in the expected direction. It is however interesting to note that **the set of descriptors for the Associate Degree was, on average, less complex than those for the Advanced Diploma and Diploma.** Furthermore, **the set of descriptors for the Advanced Diploma are, on average, similar in complexity to the Bachelor Degree and Bachelor Honours Degree.** Such findings highlight the need to further explore the complexity estimates of the individual descriptors within each set as this will assist with identifying ways in which the average estimates could be better aligned with the proposed framework.

Table XI: Descriptor Complexity descriptive statistics.

Qualification Type	Descriptor Complexity			
	Average	Minimum	Maximum	Range (maximum – minimum)
Senior Secondary Certificate of Education	136.6	124.3	149.8	25.5
Certificate I	113.8	100.0	129.7	29.7
Certificate II	119.1	105.7	135.5	29.8
Certificate III	135.1	125.9	148.4	22.5
Certificate IV	142.7	133.5	150.4	16.9
Diploma	147.5	128.3	164.1	35.8
Advanced Diploma	155.3	138.6	168.3	29.7
Associate Degree	144.6	129.3	154.2	24.9
Bachelor Degree	152.2	141.1	166.1	25.0
Bachelor Honours Degree	153.6	142.4	166.1	23.7
Graduate Certificate & Graduate Diploma	161.6	140.9	171.8	30.9
Masters Degree	161.8	146.0	180.6	34.6
Doctoral Degree	166.8	146.0	188.5	42.5

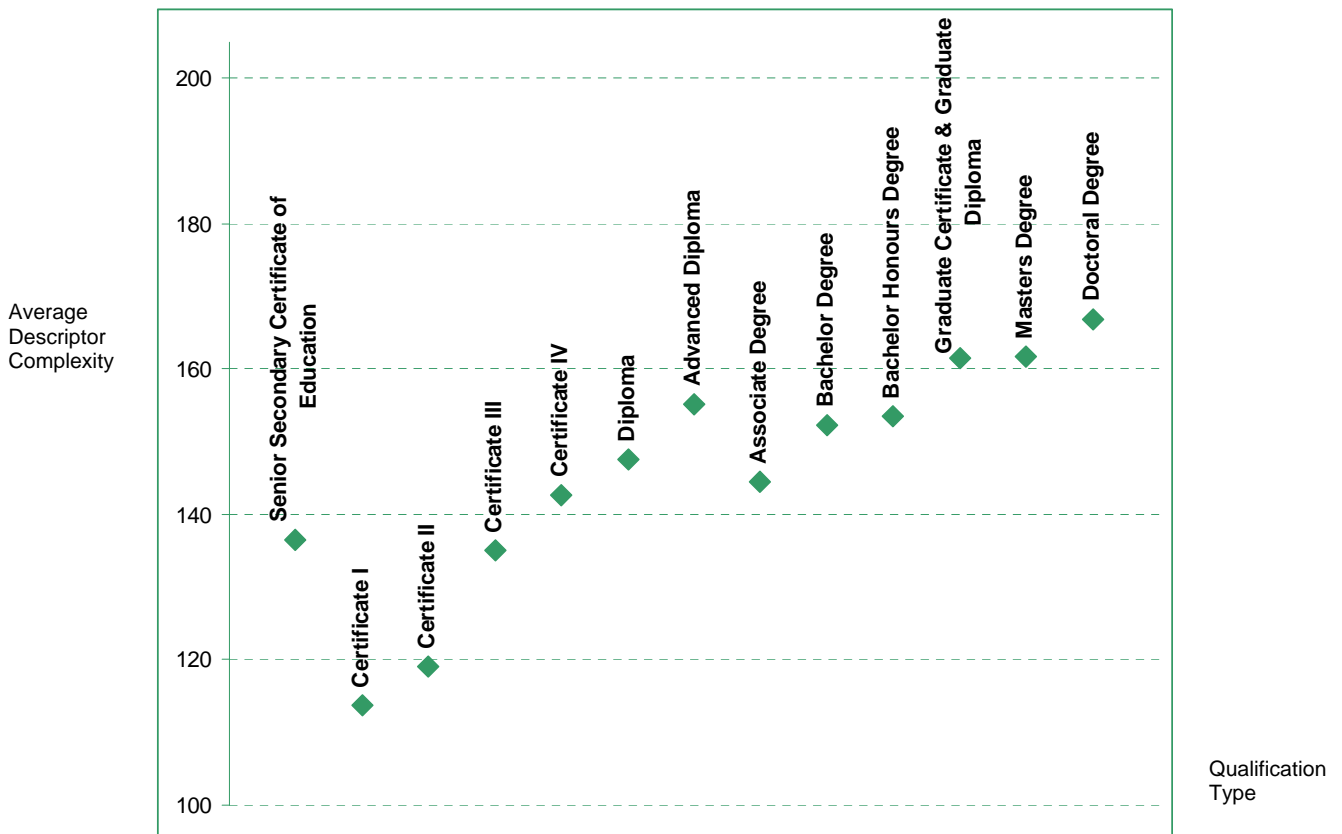


Figure 15: Average Descriptor Complexity

3.2.3 Alignment of Qualification Type Complexity and Descriptor Complexity

Table XII is a combination of Table X and Table XI and also contains the difference in complexity between the two sets of results. The difference provides an indication of how well estimates of current practice match the complexity of the descriptors used to describe the Qualification Type. Some difference between the two sets of results should be expected just due to statistical uncertainty. A large positive difference indicates that the descriptors are more complex than existing practice and, if adopted in their existing form, may have professional development implications to bridge the gap between current practice and AQF expectations. A large negative difference indicates that the current practice of the Qualification Type is more complex than that suggested by the descriptors. Such a finding may be additional evidence to suggest that some descriptors may need to be reviewed to increase the overall complexity of the set.

The Average Descriptor Complexity, in general, closely matched the Qualification Type Complexity. The largest positive differences observed were for the Advanced Diploma, Associate Degree and the Graduate Certificate & Graduate Diploma. This suggests that the current practice for these Qualification Types may be lower than described by the descriptors. Conversely, **the Doctoral Degree Qualification Type Complexity was**

higher than the Average Descriptor Complexity (i.e. a negative difference) suggesting that the actual complexity of the Doctoral Degree is higher than described by the Qualification Type Descriptors.

Table XII: Band Level Scores and Complexity Estimate for each Qualification Type based on descriptor average and direct estimate

Qualification Type	Average Descriptor Complexity	Qualification Type Complexity	Difference (Average Descriptor Complexity – Qualification Type Complexity)
Senior Secondary Certificate of Education	136.6	131.7	4.9
Certificate I	113.8	104.3	9.5
Certificate II	119.1	114.9	4.2
Certificate III	135.1	134.9	0.2
Certificate IV	142.7	140.7	2.0
Diploma	147.5	148.1	-0.6
Advanced Diploma	155.3	146.2	9.1
Associate Degree	144.6	131.2	13.4
Bachelor Degree	152.2	144.9	7.3
Bachelor Honours Degree	153.6	149.7	3.9
Graduate Certificate & Graduate Diploma	161.6	147.6	14
Masters Degree	161.8	156.3	5.5
Doctoral Degree	166.8	175.1	-8.3

One of the assumptions of the study was that the Qualification Type Descriptors were intended to describe the ideal Qualification Type which may or may not match current practice. Because of this, the remainder of the results focus on the complexity of the Qualification Type Descriptors in relation to the Levels Structure. Note that suggested adjustments to descriptors in later sections have been made in an attempt to more closely align the Qualification Type Descriptors to the Levels Structure, irrespective of the ‘actual’ level of complexity of the Qualification Type in current practice (i.e., as provided by the Qualification Type Complexity).

3.3 Qualification Type Complexity, Qualification Type Descriptors and proposed Levels

The first part of this section examines the relationship between Qualification Type Complexity, Descriptors and the Levels Structure. The second part of these results examines each set of descriptors in detail as they are aligned to the level proposed by the AQF (Appendix 1).

Figure 16 contains five sets of information for each Qualification Type that come from a variety of sources. Each set of information is explained below.

- *The X and Y axis:* The vertical (y) axis represents the complexity scale, ranging from a minimum value of 100 to a maximum value of 200. Each column on the horizontal (x) axis relates to a particular Qualification Type.
- *Level Complexity Range:* The grey rectangles represent the range of complexity in the Levels Criteria for each of the 10 levels, as specified in Table IX. For example, it has been proposed by the AQF Council that Level 8 is aligned to the Bachelor Honours Degree and to the Graduate Certificate and Graduate Diploma (refer to Appendix A). As specified in Table IX, Level 8 had a complexity range of 20.2, with a minimum scale value of 155.4 to a maximum value of 175.6. Hence, in Figure 16 both the Bachelor Honours Degree and the Graduate Certificate/Diploma have grey rectangles that are of the same height and range. Similarly, the Senior Secondary Certificate and the Certificate III are both aligned with Level 3 so the grey rectangles for these two Qualification Types are also the same height (minimum 123.5 to a maximum of 149.3) and range (i.e., 25.8).
- *Recommended Modifications to the Complexity Levels Range:* The results of the IRT analysis for the Levels Structure (see Section 3.1) suggested that the criteria in Levels 2, 7 & 9 should be reviewed. These three levels are thought to be associated with Certificate II, Bachelor Degree and Masters Degree, respectively. If previous recommendations are adopted then it is likely that the lower bound of the Complexity Levels Range will rise. That is, the grey shaded area will be reduced in size by 'lifting' the lower bound higher up the scale (the top of the shading will remain the same). This should be taken into consideration when comparing these Qualification Types to the proposed levels. To help distinguish Levels 2, 7 and 9 the shading colour in Figure 16 has been changed to orange to identify that these Levels contain statements previously identified for review.
- *Descriptor Complexity Range:* The thin green vertical rectangles indicate the range in complexity of the Qualification Type Descriptors for each Qualification Type (as

specified in Table XI). This helps give a picture of how the descriptors relate to the Levels Criteria for each Qualification Type (as depicted in the diagram using the grey rectangles). If there is a good match between the complexity of the descriptors and the proposed Level, then the green rectangles in Figure 16 (representing the Descriptor Complexity Range) should be closely aligned to the grey rectangles (representing the Level Complexity Range).

- *Qualification Type Complexity*: Finally, the average complexity of the Qualification Type (as specified in Table X) has been plotted in Figure 16 as a diamond. This may provide an indication of the complexity of the Qualification Types in current practice.

Figure 16 illustrates that the Qualification Type Complexity falls within the Descriptor Complexity Range for all Qualifications and, in most cases, also falls within the complexity range for the proposed level. For example, ***the Qualification Type Complexity was lower than the proposed Level Complexity Range for the Associate Degree, Bachelor Honours Degree and Graduate Certificate & Graduate Diploma***. It may also be lower for Certificate II, Bachelor Degree and Masters Degrees if the recommendation to adjust the complexity of these levels is adopted. This may indicate that the current practice for these Qualification Types is below the AQF's expected level of complexity.

The Senior Secondary Certificate and Certificates I-IV were all found to have a good match between the range of complexity of their descriptors and Levels Criteria.

At the higher levels it appears that the complexity of the proposed level tends to be higher than the Descriptor Complexity Range. This suggests that the ***descriptors for the higher level Qualification Types may need to be reviewed to increase their complexity.***

To provide more specific recommendations, Figures 17 to 29 examine in detail the set of Qualification Type Descriptors for each Qualification Type mapped against the proposed level. Please note that commentary regarding suggestions for removal or rewording of statements is based on empirical data only and does not take into account other substantive considerations.

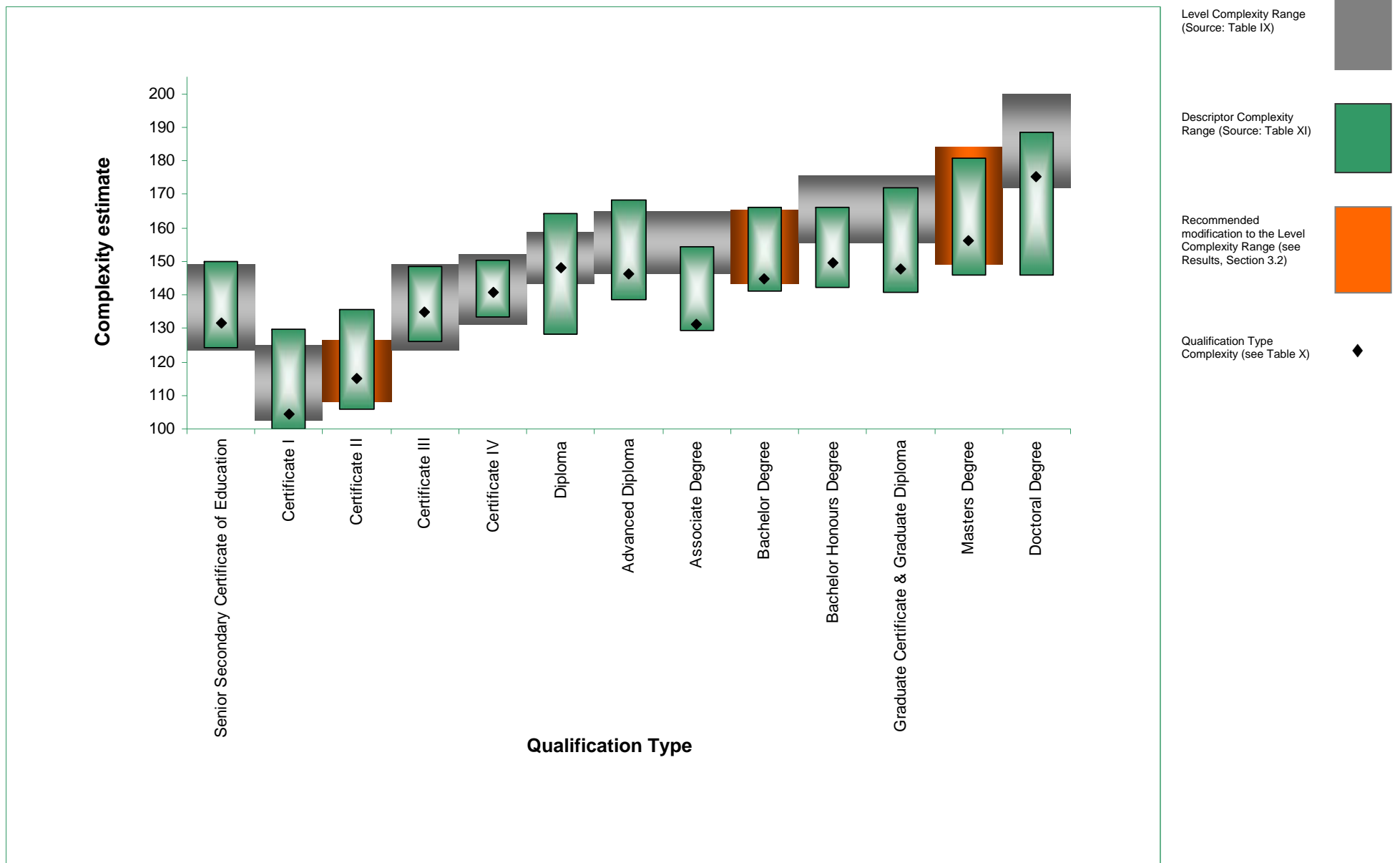


Figure 16: The relationship between Qualification Type Complexity, Descriptor Complexity Range and the Levels Structure¹⁰

¹⁰ Note: This diagram should be displayed in colour.

3.3.1 Senior Secondary Certificate of Education

Figure 17 uses a bar graph to display the complexity estimates of the eight descriptors of the Senior Secondary Certificate of Education. On the y axis is the complexity estimate scale that ranges from a minimum of 100 to a maximum of 200. On the x axis is each of the eight descriptors, as represented by their six character code (refer to Appendix 2 for a description of each code). On the same scale, Figure 17 also illustrates (via the use of a grey band) the range of complexity estimates (i.e., 26 points) for the Level 3 Criteria (as displayed in Table IX), which was the level proposed by the AQF Council for this Qualification Type.

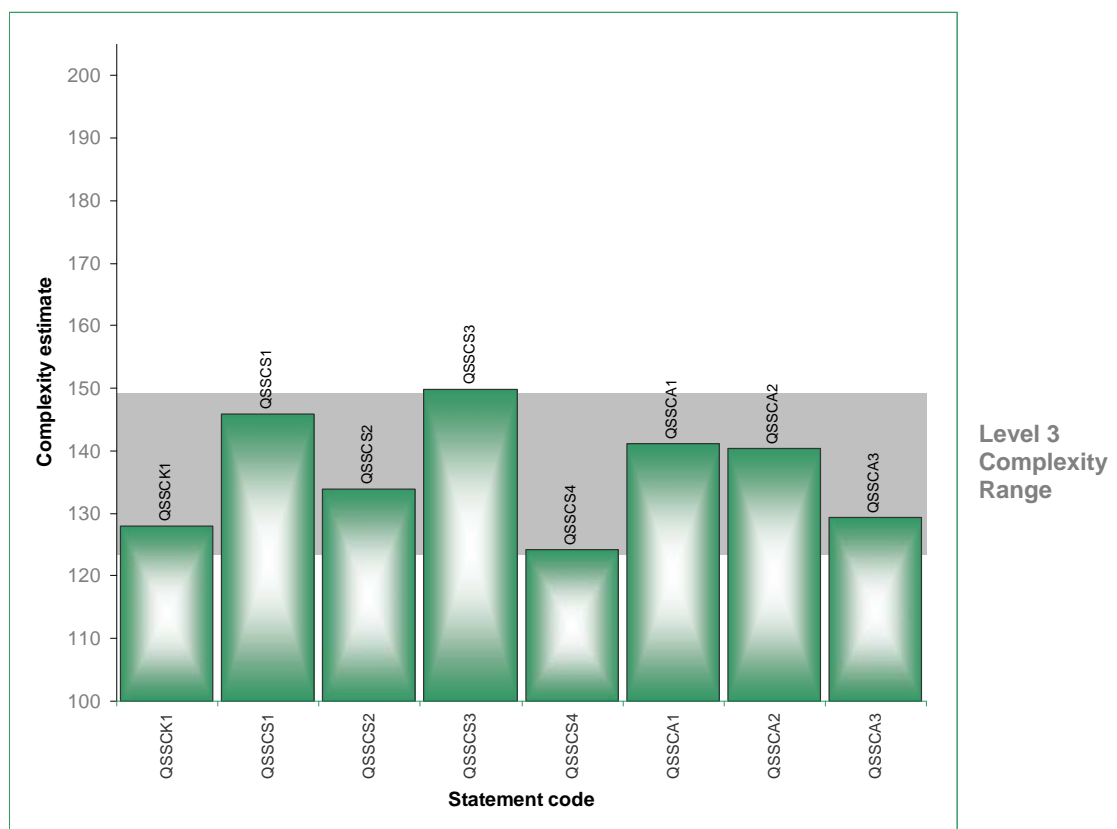


Figure 17: Senior Secondary Certificate of Education: The relationship between Qualification Type Descriptors and Level 3

As illustrated in Figure 17, **Level 3 appeared to be an appropriate level to align with the Senior Secondary Certificate of Education descriptors.** The descriptor complexity estimates ranged from a minimum of 124 (QSSCS4) to a maximum of 150 (i.e., QSSCS3), with Level 3 estimated to be around 130 on the complexity scale (average complexity estimate=133). See Table VIII for a listing of all scaled complexity estimates and discrimination values for each Qualification Type. The least complex statement was QSSCS4 “*Graduates of this qualification type will have literacy and communication skills including everyday reading, writing skills and using information communication technologies skills to present knowledge and ideas to others*” (complexity estimate = 124) whilst the most complex

descriptor was QSSCS3 “Graduates of this qualification type will have cognitive, technical, communication and creative skills for particular disciplines and to integrate disciplines and solve problems and work with others” (complexity estimate = 150). **The discrimination values for each of the 8 descriptors within the Senior Secondary Certificate of Education were also acceptable** and ranged from a minimum of 0.51 (QSSCA2) to a maximum of 0.63 (QSSCS2).

3.3.2 Certificate I

Figure 18 displays the complexity estimates of the six descriptors of the Certificate I on the same scale as the range of complexity estimates for the Level 1 Criteria (i.e., the level proposed by the AQF Council for aligning Certificate I on the Levels Structure).

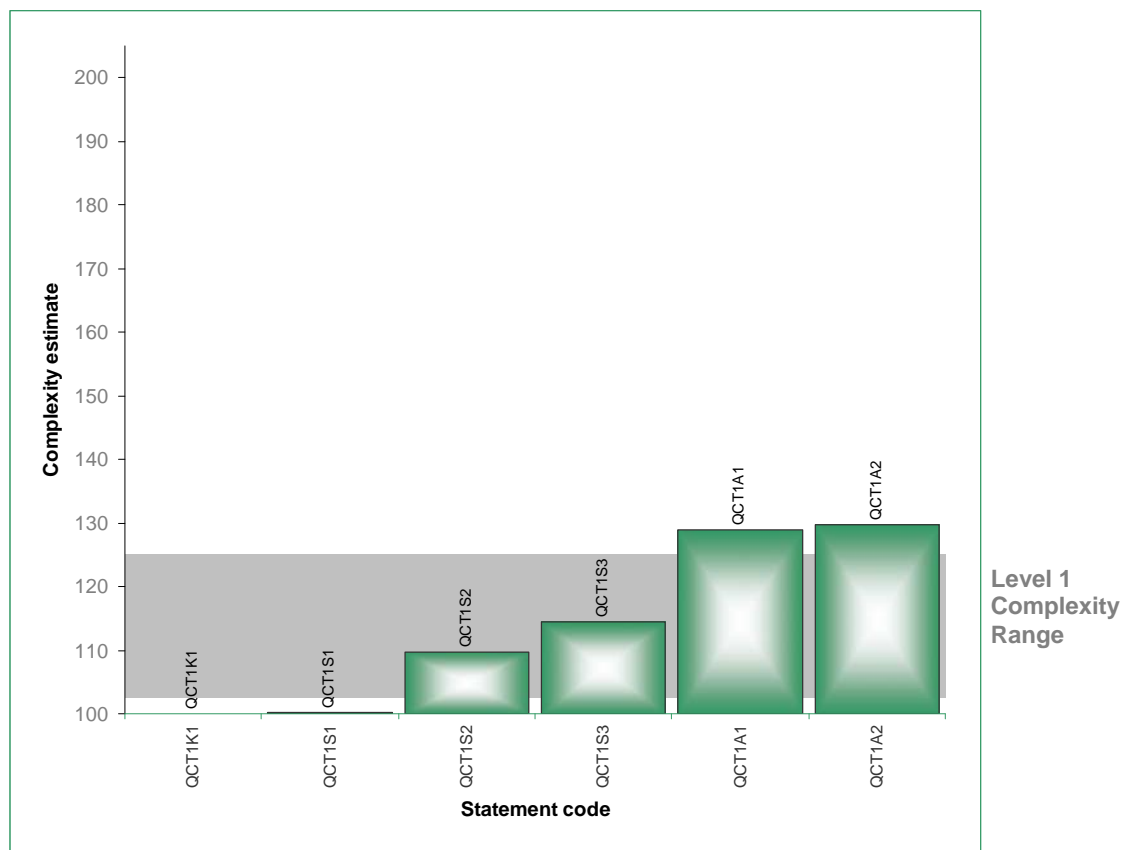


Figure 18: Certificate I: The relationship between Qualification Type Descriptors and Level 1

The average complexity estimate for the set of Level 1 criteria was 114. Figure 18 shows that the Knowledge descriptor was the least complex descriptor within the Certificate I (QCT1K1=100), and that the Application dimension was the most complex dimension, with both the application descriptors having the highest complexity estimates (QCTA1=129 & QCTA2=130). Figure 18 also shows that two of the six Qualification Type descriptors were

within the Level 1 Criteria range, which ranged from a minimum of 103 to a maximum of 125. As each statement has some degree of measurement error¹¹, then it is recommended that only descriptors that are clearly above or below the range of Levels Criteria be reviewed. The complexity estimates of the two Application descriptors (i.e., QCT1A1 & QCT1A2) appeared to be of similar complexity to QCT2A3 within the Certificate II (see Figure 19). It should also be acknowledged that both these descriptors also had high discrimination (QCT1A1=0.7 & QCT1A2=0.58, as displayed in Table VII). Given the similarity in average complexity between Level 1 and Levels 2, QCT1A1 and QCT1A2 could both be reviewed to:

- reduce their complexity to be more consistent with the remaining 4 descriptors within the set, or alternatively,
- be repositioned to Level 2 on the AQF framework.

Overall however, ***the set of Certificate I descriptors appeared to be appropriately aligned to Level 1.***

3.3.3 Certificate II

Figure 19 displays the complexity estimates of the eight descriptors of the Certificate II on the same scale as the range of complexity estimates for the Level 2 Criteria (i.e., the level proposed by the AQF Council for aligning Certificate II on the Levels Structure).

¹¹ As a guide, the 95% Confidence Interval for a statement complexity estimate is approximately +/- 5 points on the complexity scale.

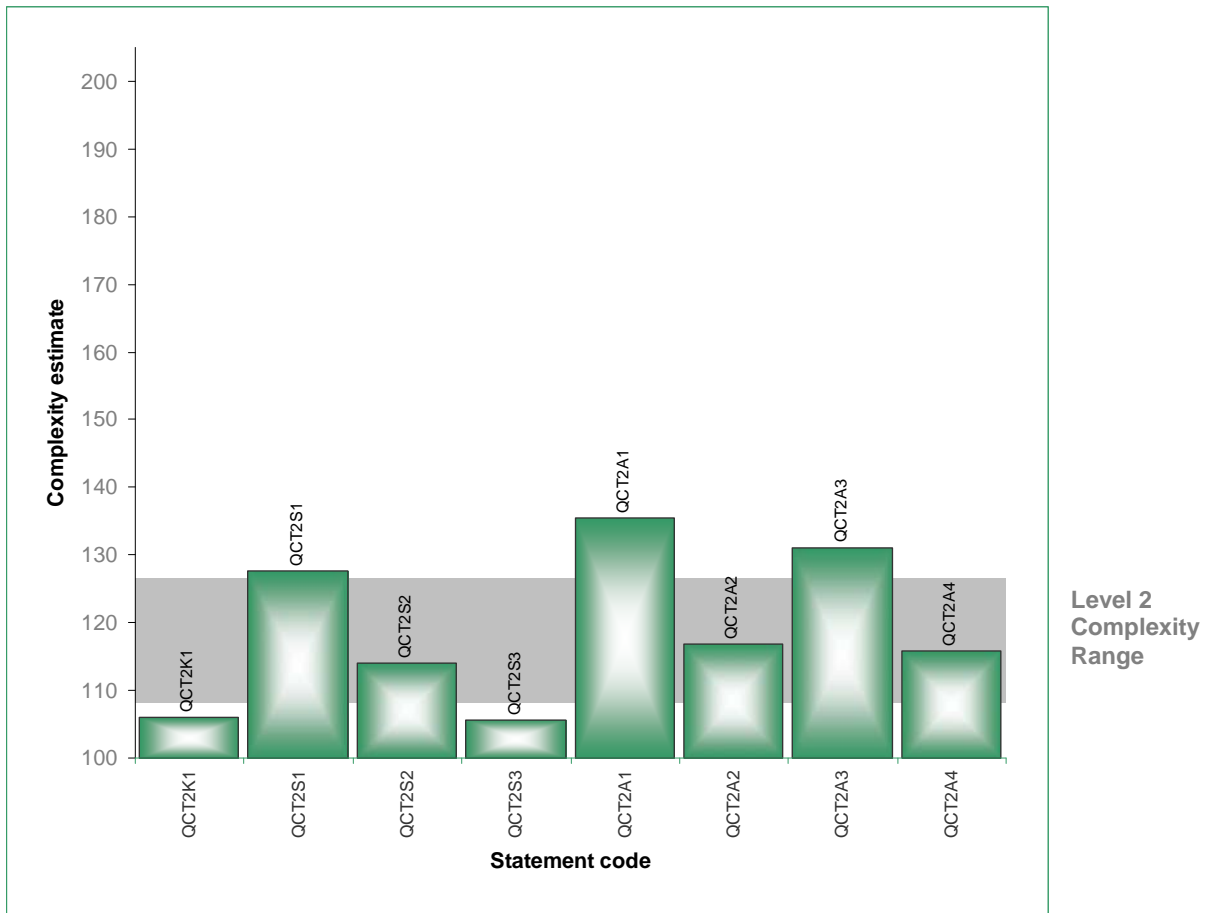


Figure 19: Certificate II: The relationship between Qualification Type Descriptors and Level 2

The Level 2 Criteria ranged from 108 to 127, with an average estimate of 114. As previously stated, Level 1 and Level 2 Criteria had a similar range of complexity estimates and it was therefore recommended that the Level 2 Criteria be reviewed to increase its overall complexity. The eight descriptors within the Certificate II Qualification Type ranged from a minimum complexity estimate of 106 (QCT2K1 and QCT2S3) to a maximum of 136 (QCT2A1), again demonstrating that the Application descriptors were more complex than the Skills and Knowledge descriptors within this Qualification Type. It is interesting to note that the least complex descriptor (QCT2K1) was very similar to the Knowledge Levels Criteria statement for Level 2 (i.e., L002K1 as displayed in Figure 12), which, not surprisingly, produced similar complexity estimates. Both the statements are provided below for illustrative purposes as well as QCT2S3 which also had a lower than expected complexity estimate.

Complexity Estimate	Discrimination Value	Code	Description
109	0.56	L002K1	Graduates at this level will have basic factual, technical and procedural knowledge in a defined area of work and learning
106	0.56	QCT2K1	Graduates of this qualification type will have basic factual, technical and procedural knowledge defined areas of work and learning
106	0.53	QCT2S3	Graduates of this qualification type will have technical skills to use a limited range of equipment to complete tasks involving known routines and procedures with a limited range of options

Although these two criteria were only slightly below the complexity range for Level 2 Criteria, it is recommended that **QCT2K1 and QCT2S3 also be reviewed at the same time as the criteria for Level 2**. This may assist with improving the progression of complexity across Level 1 and Level 2. When reviewing the Knowledge Level Criteria previously (see Figure 12) it was suggested that it might be worth slightly rewording criterion L002K1 to increase the complexity of the statement. A similar suggestion can be provided here for QCT2K1 and QCT2S3. It should be noted that all three descriptors had relatively good discrimination.

It is also interesting to note that the two most complex descriptors (i.e., QCT2A1 & QCT2A3) had complexity estimates above 130 (136 and 131, respectively) and also high discrimination of 0.63 and 0.69, respectively. The complexity estimates of **QCT2A1 and QCT2A3 were greater than some of the Application descriptors for Certificate III (i.e., QCT3A2 and QCT3A3), and therefore could possibly be reviewed to be better aligned with the complexity estimates of the remaining descriptors within the Certificate II.**

3.3.4 Certificate III

Figure 20 displays the complexity estimates of the eight descriptors of the Certificate III on the same scale as the range of complexity estimates for the Level 3 Criteria.

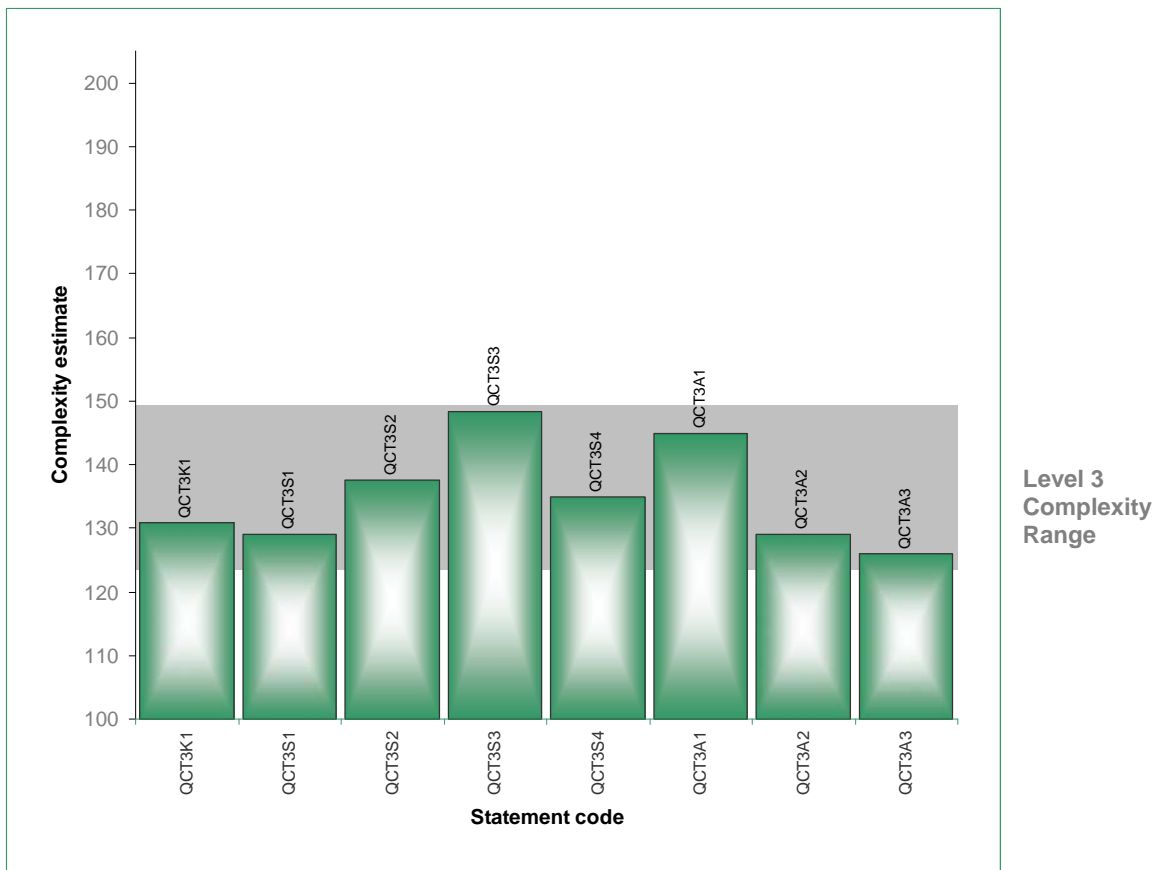


Figure 20: Certificate III: The relationship between Qualification Type Descriptors and Level 3

The eight descriptors within Certificate III all appear to be appropriately aligned to Level 3 and all have good discrimination, ranging from 0.52 to 0.62. It is interesting to note however that unlike Certificate I and II, the Application dimension was not the most difficult dimension as it appears as though the Skill Dimension was slightly more complex (as was the case with the Senior Certificate of Education).

3.3.5 Certificate IV

Figure 21 displays the complexity estimates of the eight descriptors of the Certificate IV on the same scale as the range of complexity estimates for the Level 4 Criteria.

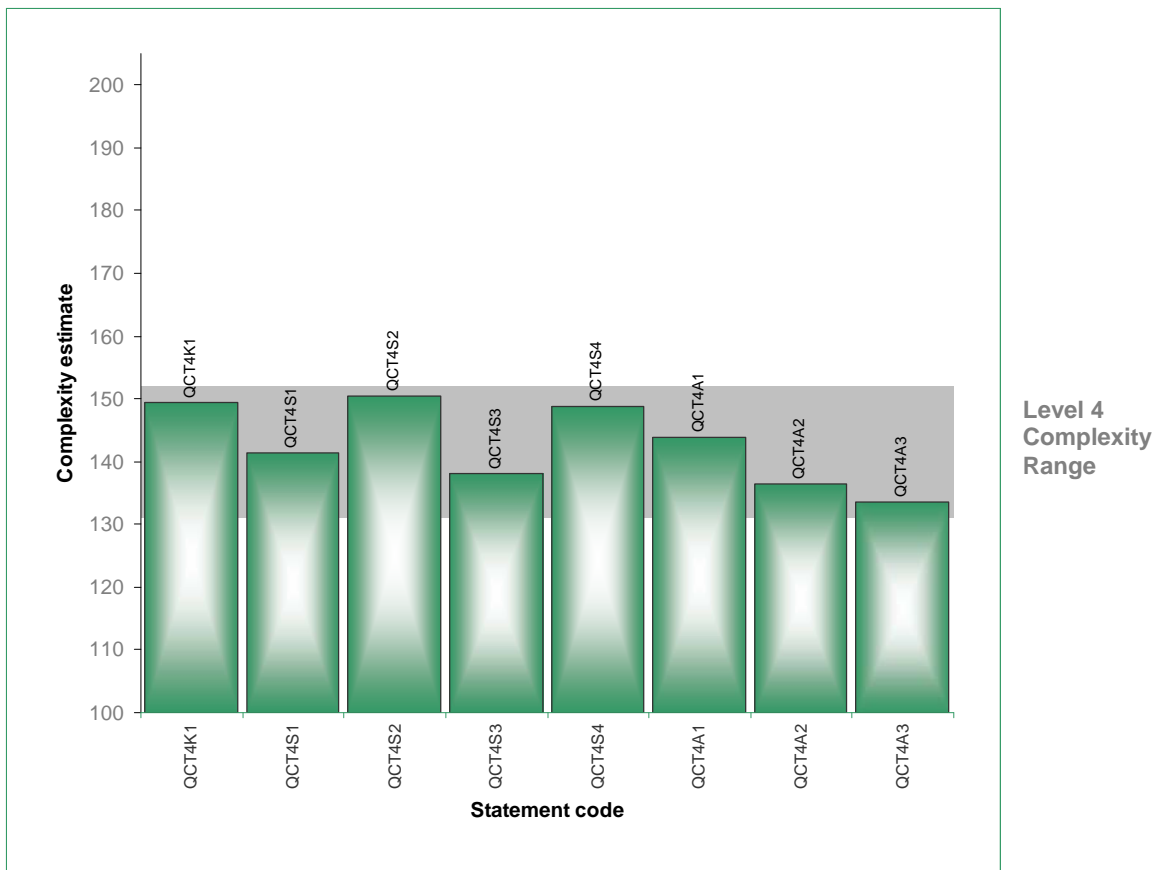


Figure 21: Certificate IV: The relationship between Qualification Type Descriptors and Level 4

As was the case with Certificate III, the ***Certificate IV Qualification Type Descriptors also appear to be well aligned to Level 4.*** Furthermore, the Knowledge and Skills dimension appeared to be slightly more difficult than the Application dimension within this Qualification Type.

3.3.6 Diploma

Figure 22 displays the complexity estimates of the nine descriptors of the Diploma on the same scale as the range of complexity estimates for the Level 5 Criteria.

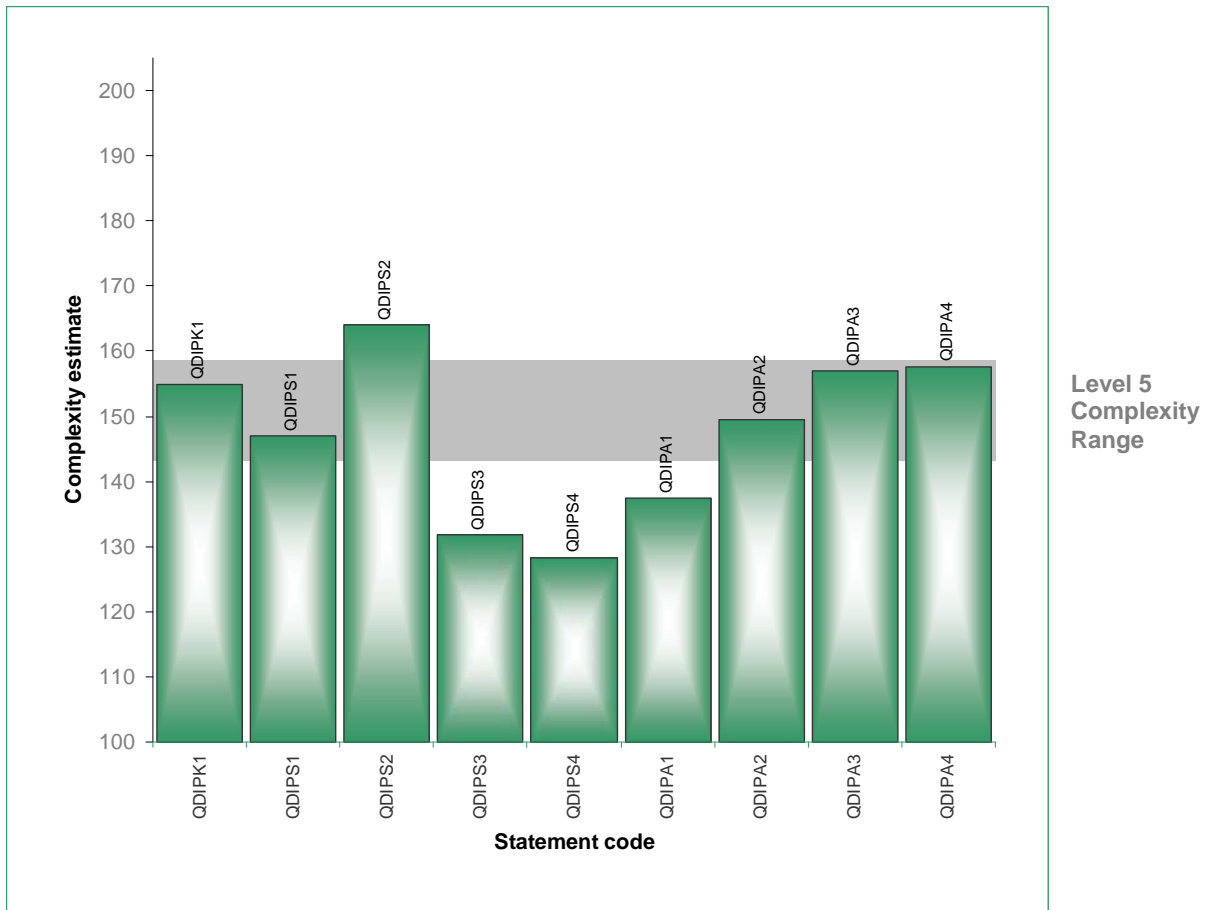


Figure 22: Diploma: The relationship between Qualification Type Descriptors and Level 5

There were three descriptors within the Diploma that had lower than expected complexity estimates for Level 5, namely QDIPS3, QDIPS4 and QDIPA1. Whilst these three descriptors had reasonable discrimination, their complexity estimates were similar to those at Level 2, and therefore should be reviewed. Given that each was discriminating well, one possible solution would be for realignment to a lower qualification on the levels framework.

Complexity Estimate	Discrimination Value	Code	Description
137	0.54	QDIPA1	Graduates of this qualification type will demonstrate the application of knowledge and skills with depth in some areas, in known or changing contexts
132	0.47	QDIPS3	Graduates of this qualification type will have technical and creative skills to express ideas and perspectives
128	0.47	QDIPS4	Graduates of this qualification type will have communication skills to transmit knowledge and skills to others and demonstrate understanding of knowledge

3.3.7 Advanced Diploma

Figure 23 displays the complexity estimates of the nine descriptors of the Advanced Diploma on the same scale as the range of complexity estimates for the Level 6 Criteria.

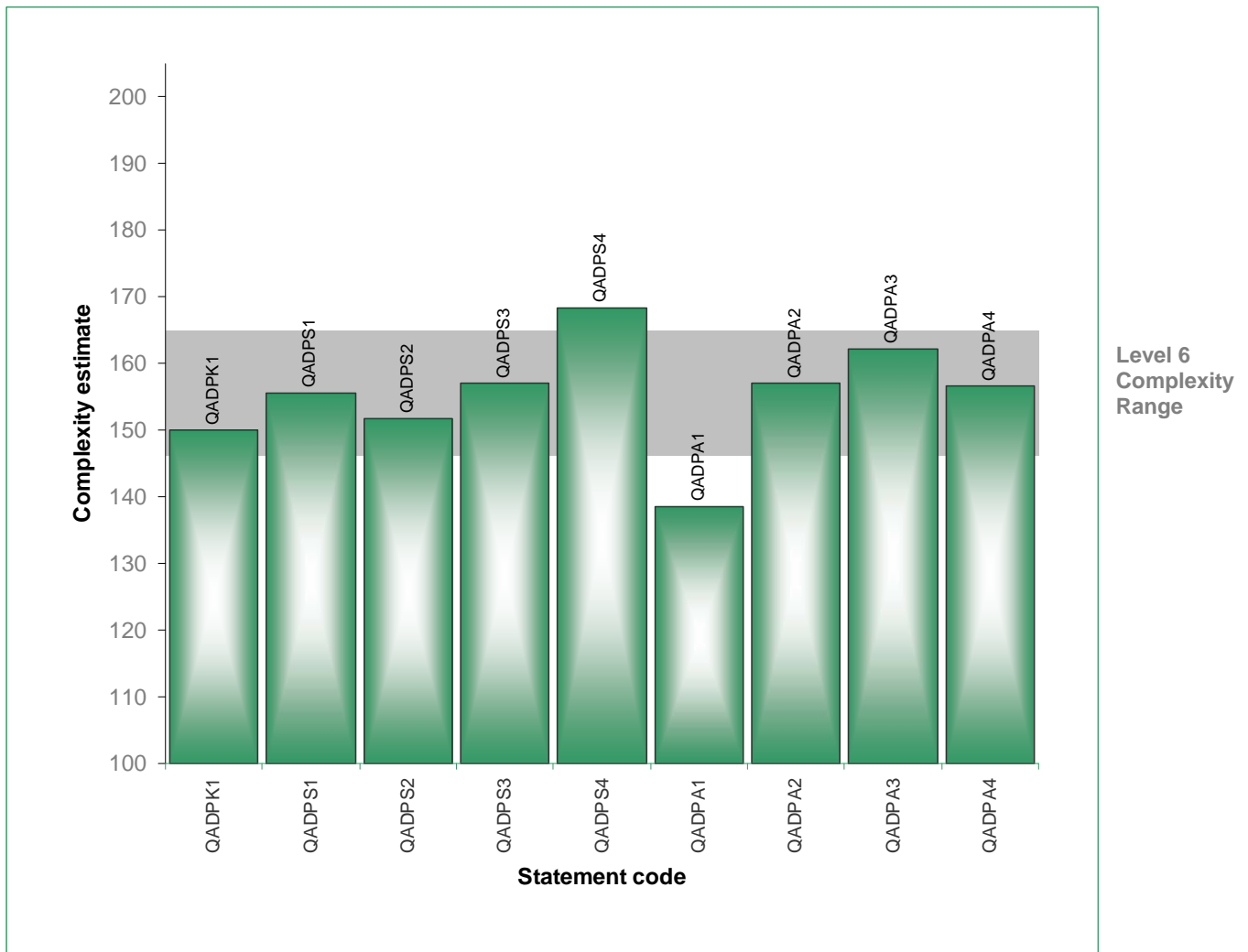


Figure 23: Advanced Diploma: The relationship between Qualification Type Descriptors and Level 6

With the exception of QADPA1 and QADPS4, the descriptors for the Advanced Diploma appear to be well aligned to Level 6. Again, these two descriptors should be reviewed. It should be noted that all nine descriptors had good discrimination, ranging from a minimum of 0.49 (QADPS1) to a maximum of 0.61 (QADPA4 & QADPA2). In relation to the complexity estimates, QADPS4 appeared to be at a much higher level on the framework than anticipated, whilst QADPA1 was at a much lower level. Given that both had good discrimination, it may be more appropriate to have these two descriptors realigned to a different qualification type at a different level. For instance, QADPS4 “*Graduates of this qualification type will have wide-ranging, highly specialised technical, creative or conceptual*

skills to express ideas and perspectives” was found to be too complex for Level 6. Alternatively, the descriptor QADPA1 “Graduates of this qualification type will demonstrate the application of knowledge and skills with depth in some areas, in contexts subject to change” appeared to better align to Level 4.

3.3.8 Associate Degree

Figure 24 displays the complexity estimates of the six descriptors of the Associate Degree on the same scale as the range of complexity estimates for the Level 6 Criteria.

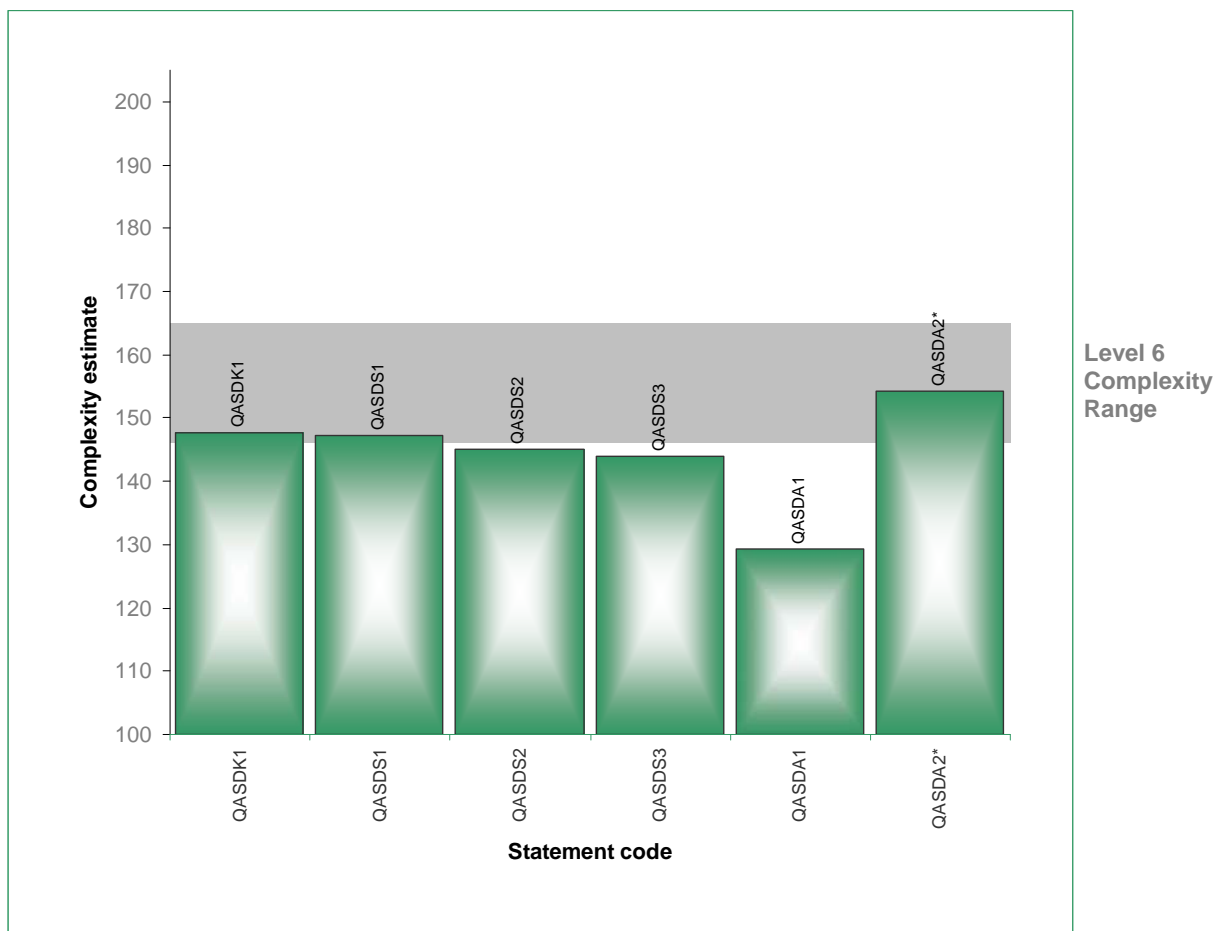


Figure 24: Associate Degree: The relationship between Qualification Type Descriptors and Level 6

Whilst it can be seen in Figure 24 that three of the six descriptors were within the Level 6 range of complexity estimates, the average complexity estimate of the Associate Degree descriptor was around Level 4 to Level 5 on the framework (Average Descriptor Complexity Estimate = 145), as the majority of the descriptors were at positioned toward the bottom of the criteria range or below. That is, with the exception of QASDA2*, the descriptors tended to be judged to be lower in complexity than that expected of a Level 6 Qualification Type. Note that the asterisk (*) indicates that this descriptor was common to at least one other

Qualification Type (refer to Appendix 2) which, in this case, was the Bachelor Degree and Bachelor Honours Degree (i.e., QBADA2 & QBAHA2). Two of the descriptors also had discrimination values of 0.4 or less, namely QASDS1 (0.37) and QASDA1 (0.34). ***It is therefore recommended that QASDA1 be considered for removal as it had a much lower than expected complexity estimate (129) and a discrimination value of 0.34.***

In conclusion, the findings suggest that ***the level of the Associate Degree has been proposed incorrectly or that the descriptors need to be reworded to increase their complexity.*** Please note that the complexity estimates for the Associate Degree have been calculated using the ratings of at least 181 respondents, and therefore, are considered to be reliable and stable estimates, despite the fact that only eight people selected this Qualification Type to be surveyed.

3.3.9 Bachelor Degree

The Bachelor Degree comprised eight descriptors and was thought to be positioned at Level 7 on the framework. Figure 25 displays the relationship between the complexity estimates of the Bachelor Degree descriptors and the range of complexity for the Level 7 criteria.

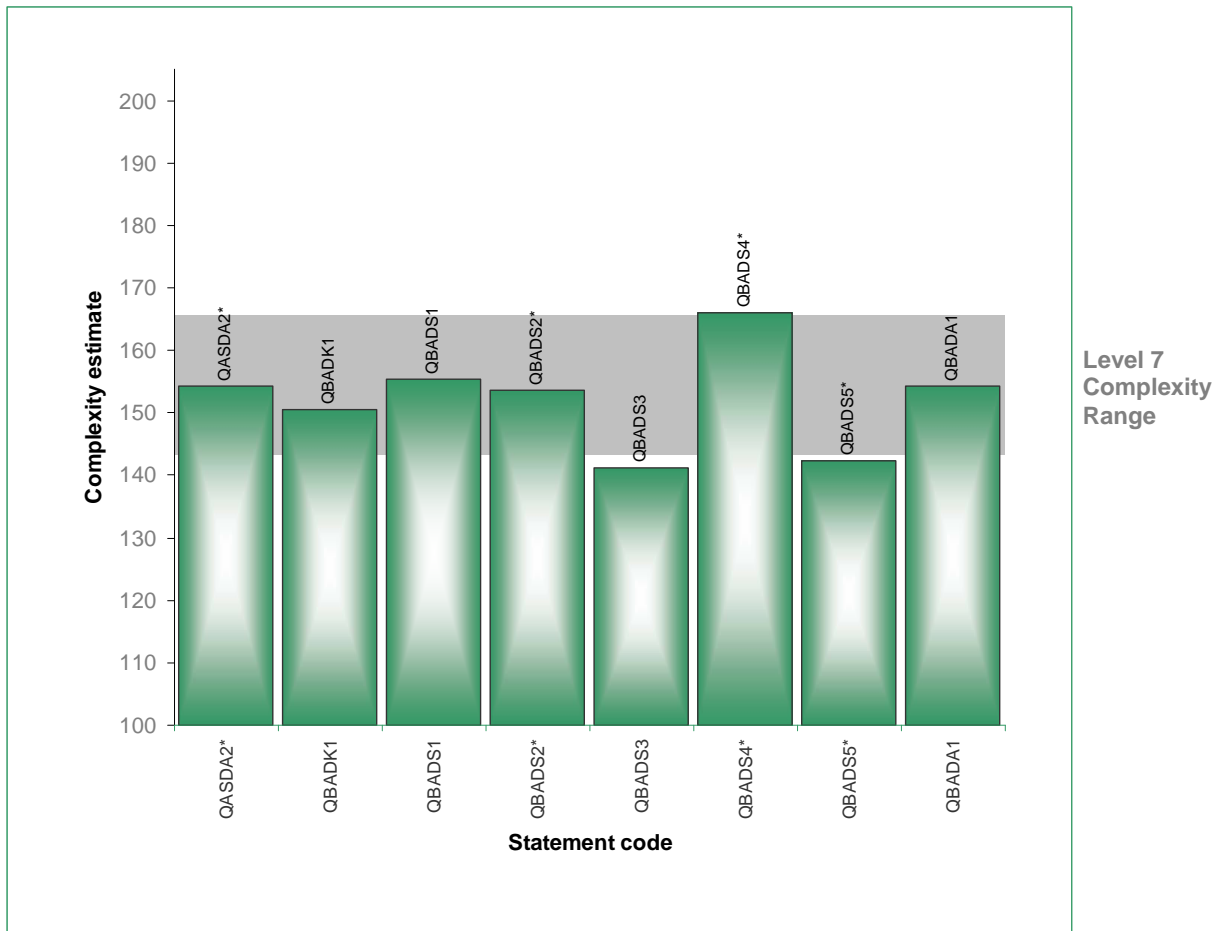


Figure 25: Bachelor Degree: The relationship between Qualification Type Descriptors and Level 7

The complexity estimates for the Level 7 criteria ranged from 143 to 166. Figure 25 illustrates that 6 of the 8 descriptors were within the range of complexity of the Level 7 criteria, with the remaining two descriptors just slightly below the lower end of the band level. Although it can be concluded that the *Bachelor Degree descriptors, as a set, were well placed at Level 7 on the framework, it should be acknowledged that the set of criteria for Level 7 (as previously displayed in Figure 10) was found to be too low.* If, as recommended earlier, that this set of criteria be revised to increase its overall complexity, then QBADS3 and QBADS5* will have considerably lower than expected complexity estimates and would, therefore, also need to be reviewed. It should also be acknowledged that although QBADK1 had a complexity estimate well within the range of level 7 criteria (i.e., 151), it had a discrimination value of 0.38, indicating that it should be reviewed.

3.3.10 Bachelor Honours Degree

The Bachelor Honours Degree had 10 descriptors and was thought to be positioned at Level 8 on the framework. Figure 26 displays the relationship between the complexity estimates of the Qualification Type Descriptors and the range of complexity for the Level 8 criteria.

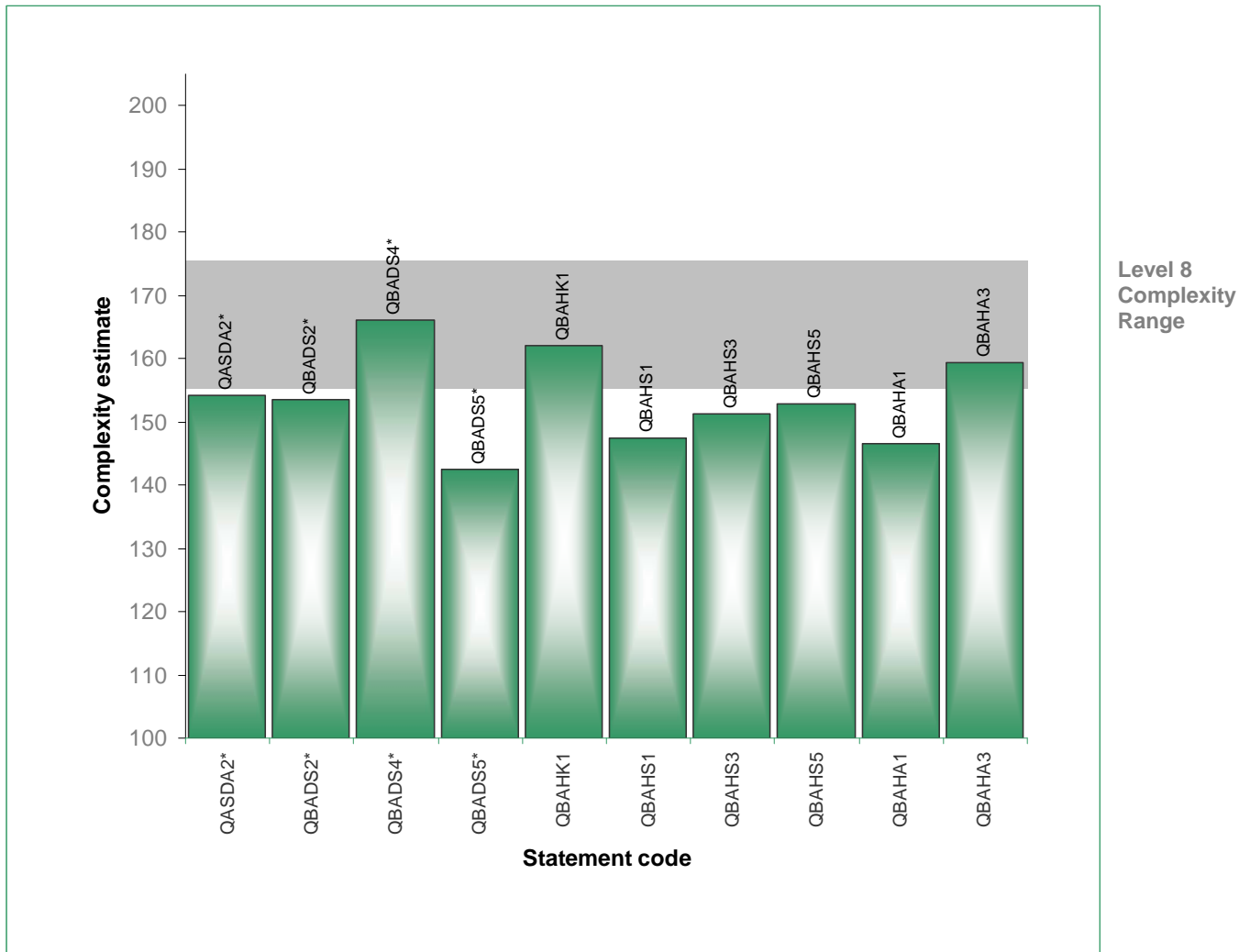


Figure 26: Bachelor Honours Degree: The relationship between Qualification Type Descriptors and Level 8

Overall, the **Bachelor Honours Degree descriptors tended to be at the bottom of, or below, Level 8 on the framework.** As was the case for the Bachelor Degree, Figure 26 illustrates a potential issue with QBADS5*, in which it was found to be less complex than expected for this type of qualification. It may be worth considering whether the Bachelor Honours Degree could be described at Level 8 by using only the following three descriptors which covered all three dimensions and had complexity estimates within the desired range, as well as acceptable discrimination:

Complexity Estimate	Discrimination value	Code	Description
162	0.45	QBAHK1	Graduates of this qualification type will have a systematic coherent body of knowledge of the underlying principles and concepts in one or more disciplines and knowledge of research principles and methods
166	0.52	QBADS4* QBAHS4	Graduates of this qualification type will have cognitive skills to exercise critical judgement and critical thinking in creating new understanding
159	0.53	QBAHA3	Graduates of this qualification type will demonstrate the application of knowledge and skills by planning and executing project work and/or a piece of research and scholarship

3.3.11 Graduate Certificate & Graduate Diploma

The Graduate Certificate and Graduate Diploma had nine descriptors and were thought to be positioned at Level 8 on the framework. Figure 27 displays the complexity estimates for each of the nine descriptors as well as the range of complexity for Level 8 Criteria.

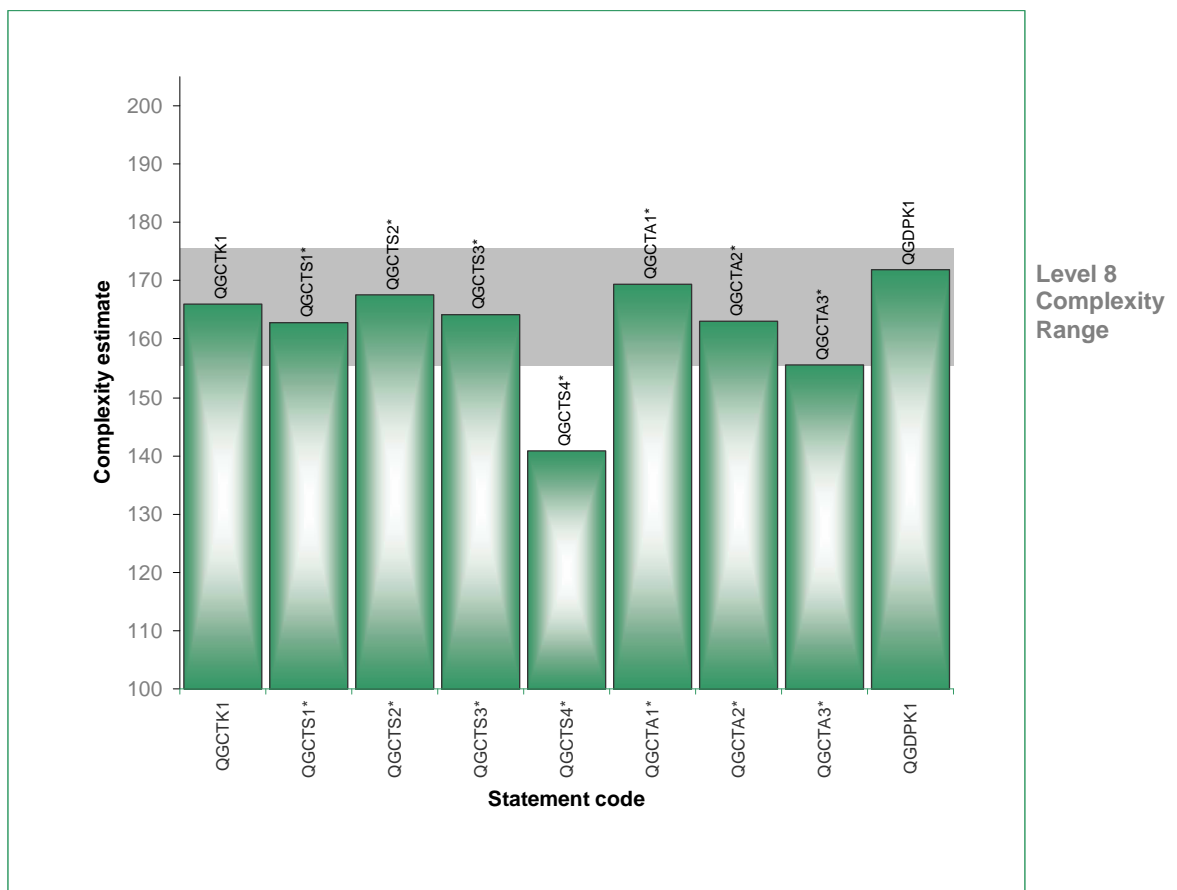


Figure 27: Graduate Certificate & Graduate Diploma: The relationship between Qualification Type Descriptors and Level 8

Figure 27 shows that 8 of the 9 descriptors were within the range of complexity estimates for Level 8. However, QGCTS4* has produced a complexity estimate that is equivalent to a Level 4 qualification and should either be reworded or removed from the set and possibly realigned to a lower Qualification Type. All nine descriptors had good discrimination, ranging from a minimum of 0.45 to a maximum of 0.60. It can therefore be concluded that, **with the exception of QGCTS4*, the set of descriptors for the Graduate Certificate and Graduate Diploma have been appropriately aligned to Level 8.**

Complexity Estimate	Discrimination Value	Code	Description
141	0.46	QGCTS4* QGDPS4	Graduates of this qualification type will have communication skills to present knowledge and ideas to a range of audiences

3.3.12 Masters Degree

Figure 28 displays the complexity estimates of the 13 descriptors of the Masters Degree (both Research and Other kinds) on the same scale as the range of complexity estimates for the Level 9 Criteria.

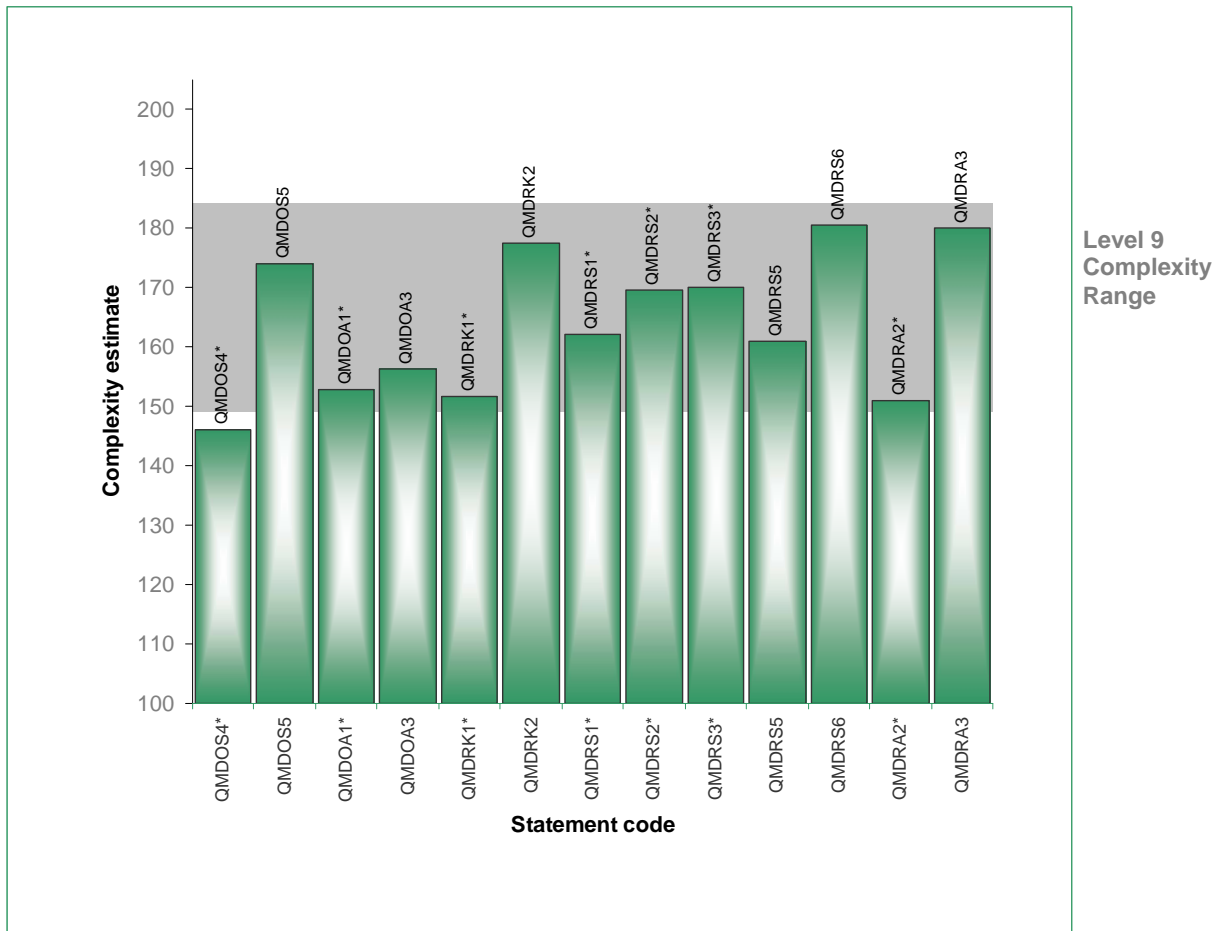


Figure 28: Masters Degree: The relationship between Qualification Type Descriptors and Level 9

Level 9 on the framework was found to have an average estimate of complexity of approximately 175 (see Table IX), ranging from a minimum of 149 to a maximum of 184. It therefore appears that 13 of the 14 descriptors were within the expected range of complexity for Level 9. However, as previously stated, criterion L009K1 had a lower than expected complexity estimate (i.e., 148), with the next most complex criterion having a complexity estimate of 178. If, as recommended L009K1 be strengthened for its complexity, then the range of complexity for Level 9 criteria will be much narrower (e.g., if L009K1 is removed, the lower bound will move from 149 to 178 making it a much narrower band); and will increase the average complexity of the set of criteria. If this occurs, then there will be a number of descriptors from the Master Degree which will also be considerably 'below the expected level'. ***If the Level 9 range of complexity has the outlier removed (i.e., L009K1), it will have a narrower range (i.e., will range from 178 to 184). This will mean that only 4 descriptors will be within or around this range level.*** These four descriptors, along with their complexity estimates and discrimination values have been displayed below.

Complexity Estimate	Discrimination Value	Code	Description
178	0.69	QMDRK2	Graduates of this qualification type will have advanced knowledge of research principles and methods applicable to the field of work or learning
180	0.60	QMDRS6	Graduates of this qualification type will have communication skills to present a well ordered dissertation, non-print thesis or portfolio, for submission to external examination and to disseminate research results to specialist and non-specialist audiences
174	0.64	QMDOS5	Graduates of this qualification type will have communication and technical research skills to justify theoretical propositions, methodologies and conclusions to specialist and non-specialist audiences
180	0.66	QMDRA3	Graduates of this qualification type will demonstrate the application of knowledge and skills in the planning and execution of a substantial piece of scholarship and/or research

It is interesting to note that three of the four descriptors above were specific to the Master Degree (Research) while only one was specific to the Master Degree (Other).

3.3.13 Doctoral Degree

Figure 29 displays the complexity estimates of the 14 descriptors of the Doctoral Degree (both Research and Other kinds) on the same scale as the range of complexity estimates for the Level 10 Criteria.

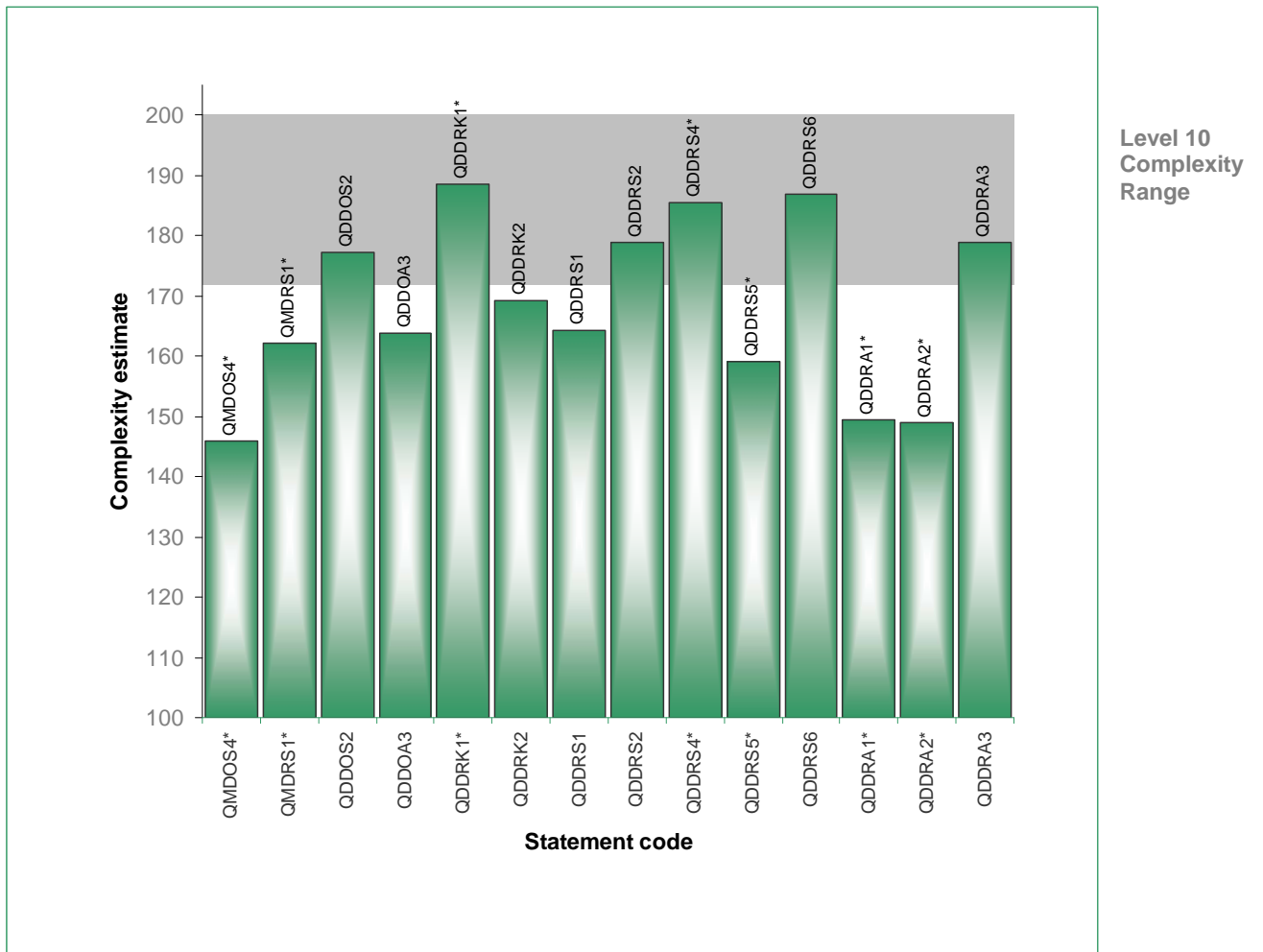


Figure 29: Doctoral Degree: The relationship between Qualification Type Descriptors and Level 10

Figure 29 clearly demonstrates that there ***were a number of descriptors (i.e., 7 of the 14) that had a much lower than expected complexity estimate for the Doctoral Degree.*** There were 7 statements which appeared to capture the relevant level of complexity proposed for a Doctoral Degree. These have been presented below in decreasing order of complexity.

Complexity Estimate	Discrimination Value	Code	Descriptors
189	0.66	QDDRK1* QDDOK1	Graduates of this qualification type will have a substantial body of knowledge at the frontier of a field of work or learning that makes an original contribution
187	0.59	QDDRS6	Graduates of this qualification type will have technical skills to design, implement, analyse, theorise and write research that makes a significant and original contribution to knowledge
185	0.63	QDDRS4* QDDOS5	Graduates of this qualification type will have communication skills to cogently present a well ordered complex investigation or original research for external examination against international standards and to communicate results to peers and the community
179	0.57	QDDRS2	Graduates of this qualification type will have cognitive skills and using intellectual independence, think critically, evaluate existing knowledge and ideas, undertake systematic investigation and reflection on a field of knowledge and practice to generate new knowledge
179	0.59	QDDRA3	Graduates of this qualification type will demonstrate the application of knowledge and skills in the planning and execution of original research
172	0.61	QDD0S2	Graduates of this qualification type will have cognitive skills using intellectual independence to think critically, evaluate existing knowledge and ideas, undertake systematic investigation and reflection on professional theory and practice to generate new knowledge
169	0.71	QDDRK2	Graduates of this qualification type will have substantial knowledge of research principles and methods applicable to the field of work or learning

It is suggested that the Council review the substantive contribution of those descriptors with a complexity estimate of less than 165 (i.e., QMDRS1*, QDDRS1, QMDOS4*, QDDRS5, QDDRA1, **QDDRA2*** & QDDOA3) in terms of describing the expected learning outcomes of doctoral degrees, particularly QDDRA2* which had a lower discrimination value (i.e., 0.39) than the remaining descriptors.

3.4 Summary of Suggested Statements for Review

The suggested changes to statements recommended throughout this report have been grouped below according to the research team’s perceived priority of importance. High Priority has been used to describe the set of statements that had both unexpected complexity estimates (i.e., either considerably ‘too high’ or ‘too low’ for the expected level) and low discrimination in comparison to the remaining set of statements. It is recommended that these statements undergo revision, be reworded, or possibly be removed. Next is a set of statements that have been classified as medium priority as they have good discrimination, but unexpectedly lower or higher than expected complexity estimates and therefore, could possibly be reworded or realigned to another Level/Qualification Type. Finally, those statements that had low discrimination but complexity estimates within the expected range have been classified as low priority. These statements may have been ambiguous for respondents and the discrimination could be improved by reviewing the wording of the statement. Alternatively, such statements could be considered redundant if other statements, of similar complexity and substantive meaning, are available.

Please note that removal of items should not be based purely on empirical grounds. The substantive contribution of the statement to describing either the AQF level or Qualification Type would need to be determined. Therefore any changes to the statements would need to be undertaken in consultation with key stakeholders and the empirical findings should only be used to highlight statements within the framework that could be reviewed to strengthen the overall framework.

High Priority: Statements possibly to be removed due to unexpected Complexity Estimate and Low Discrimination or if not, reworded to improve discrimination and complexity have been presented in Table XIII.

Table XIII: Statements Recommended for Review – High Priority

Level / Qualification Type	Statement Code	Discrimination	Complexity Estimate
Level 7	L007A2	0.35	143.3
Level 8	L008A2	0.37	157.4
Associate Degree	QASDA1	0.34	129.3
Doctoral Degree	QDDRA2*	0.39	148.9

Medium Priority: Statements possibly to be realigned to another level or qualification due to good discrimination but unexpected Complexity Estimates have been presented in Table XIV. If realignment is not appropriate, then these items should be reworded to better match the expected complexity. Note that the asterisk (*) indicates that the descriptor was common to at least one other Qualification Type.

Table XIV: Statements Recommended for Review – Medium Priority

Level	Level Code	Discrimination	Complexity Estimate	Qualification Type	Descriptor Code	Discrimination	Complexity Estimate
Level 1	L001A1	0.64	125.1	Certificate I	QCT1A1	0.70	129.0
Level 2	L002K1	0.56	109.4		QCT1A2	0.58	129.7
	L002S1	0.51	108.2	Certificate II	QCT2K1	0.56	106.1
	L002S2	0.62	112.8		QCT2S3	0.53	105.7
Level 3	L003S2	0.61	149.3		QCT2A1	0.63	135.5
Level 4	L004K1	0.58	148.4	Diploma	QCT2A3	0.69	131.0
	L004S2	0.54	152.0		QDIPS3	0.47	131.8
Level 5	L005K1	0.50	152.8		QDIPS4	0.47	128.3
	L005S2	0.51	158.7	QDIPA1	0.54	137.5	
	L005S3	0.58	152.4	Advanced Diploma	QADPS4	0.57	168.3
Level 6	L006A1	0.54	146.2		QADPA1	0.50	138.6
	L006S2	0.52	164.9	Associate Degree	QASDK1	0.48	147.6
Level 7	L007K1	0.47	149.3		QASDS2	0.47	145.0
	L007S1	0.45	148.2		QASDS3	0.51	144.0
	L007S3	0.44	143.6	Bachelor Degree	QBADS3	0.45	141.1
Level 8	L008S3	0.45	155.4		QBADS5*	0.43	142.4
Level 9	L009K1	0.46	149.1	Bachelor Degree (Honours)	QBAHS1	0.44	147.5
Level 10	L010K1	0.44	171.9		QBAHS3	0.53	151.2
					QBAHS5	0.58	152.9
					QBAHA1	0.54	146.6
				Graduate Certificate	QGCTS4*	0.46	140.9
				Master Degree	QMDOS4*	0.58	146.0
					QMDOA1*	0.50	152.9
					QMDOA3	0.62	156.3
					QMDRK1*	0.44	151.8
					QMDRS1*	0.53	162.2
					QMDRS2*	0.44	169.5
					QMDRS3*	0.56	170.0
					QMDRS5	0.62	160.9
				QMDRA2*	0.55	150.9	
				Doctoral Degree	QDDOA3	0.63	163.8
					QDDRS1	0.44	164.3
					QDDRS5*	0.57	159.1
					QDDRA1*	0.47	149.5

Low Priority: Statements with low discrimination but acceptable complexity estimates could be reworded to improve their discrimination have been presented in Table XV. Statements may be considered redundant and hence removed, if other statements of similar complexity and substantive contribution (but higher discrimination) are available.

Table XV: Statements Recommended for Review – Low Priority

Qualification Type	Statement Code	Discrimination	Complexity Estimate
Certificate I	QCT1K1	0.38	100
	QCT1S1	0.39	100.2
Associate Degree	QASDS1	0.37	147.3
Bachelor Degree	QBADK1	0.38	150.6