Tertiary Education Commission
Te Amorangi Mātauranga Matua

Project Report

Performance-Based Research Fund 2018 Quality Evaluation

Published by the Tertiary Education Commission

Te Amorangi Mātauranga Matua

National Office
44 The Terrace
PO Box 27048
Wellington, New Zealand

Interim report published: 30 April 2019

Final report published: 12 September 2019

ISBN 978-0-473-47889-6 (electronic)

Authors

The Tertiary Education Commission

Every effort is made to provide accurate and factual content. The TEC, however, cannot accept responsibility for any inadvertent errors or omissions that may occur.

This work is licensed under the Creative Commons Attribution 4.0 International licence. You are free to copy, distribute, and adapt the work, as long as you attribute the work to the Tertiary Education Commission and abide by the other licence terms. Please note you may not use any departmental or governmental emblem, logo, or coat of arms in any way that infringes any provision of the Flags, Emblems, and Names Protection Act 1981.

Contents

Contents 1
Tables 2
Figures 2
Executive summary 3
The PBRF – an overview 7
Assessing research performance 8
The Quality Evaluation submission process 10
An overview of the submission process 10
The 2018 Quality Evaluation submission 11
Ensuring the integrity of the submission process 11
Peer-review panels 13
An overview of the panel process 13
Assessment process 17
Pre-meeting assessment and scoring 18
Panel meeting assessment and scoring 19
Ensuring the integrity of the panel process 20
Further discussion and next steps 23
Points for further discussion 23
Next steps 24
Appendix 1: Further reading 25
Appendix 2: Glossary 26

Tables

Table 1: Reporting publications for the PBRF 2018 Quality Evaluation 4

Table 2: Panel size and the number of EPs that each panel assessed 14

Table 3: Number of EPs transferred by panel 16

Table 4: NROs submitted and percentage examined by panel 18

Table 5: Indicative Quality Categories determined at the preliminary score stage 19

Table 6: Increases to calibrated panel Quality Category scores following detailed holistic assessment 20

Figures

Figure 1: The stages of the PBRF 2018 Quality Evaluation process 9

Figure 2: Journey of an Evidence Portfolio 10

Figure 3: The five-stage assessment of an Evidence Portfolio 17

Executive summary

The Performance-Based Research Fund (PBRF) was introduced in 2002 to increase the quality of New Zealand research. It is a performance-based funding scheme designed to encourage and reward excellent research in New Zealand's degree-granting organisations.

In total, the PBRF allocates $315 million per annum, or approximately $1.8 billion in a six-year period. It is one of the TEC's largest funds.

Purpose of report

The purpose of this report is for the TEC Quality Evaluation Project Team to provide:

› an overview of how the PBRF 2018 Quality Evaluation was conducted

› assurance to the TEC Board of Commissioners, Ministers, tertiary education organisations (TEOs), research staff, and the public that the *PBRF 2018 Quality Evaluation Guidelines* (the Guidelines) were adhered to and we have confidence in the results

› recommendations for the next PBRF review scheduled for mid-2019, and any subsequent TEC project teams.

Working with the tertiary education sector, we have developed a new approach to reporting on the results of this round of the Quality Evaluation.

The objectives of the TEC's reporting of the 2018 results are:

› to give meaning to the outcomes

› to provide value to the sector

› to make the results accessible to a wide audience.

To achieve these objectives, this report is enhanced by additional outputs. These outputs and their audiences are described in Table 1.

Because this report is based on the processes undertaken to conduct the PBRF 2018 Quality Evaluation, numbers and percentages in this report are based on the number of Evidence Portfolios (EPs) submitted, inclusive of those that received funded and unfunded Quality Categories.

Numbers and percentages are not full-time employment (FTE) weighted. For this reason, some numbers and percentages will be different from what is reported in *Improving Research Quality: The results of the PBRF 2018 Quality Evaluation* and other reporting outputs.

Table 1: Reporting publications for the PBRF 2018 Quality Evaluation

OUTPUT	DESCRIPTION	TEOs ONLY	TEOs AND PUBLIC
Improving Research Quality: The results of the PBRF 2018 Quality Evaluation	Presents the results of the PBRF 2018 Quality Evaluation and provides analysis and background		√
Report of the Moderation Panel and the Peer-Review Panels	Overview of the process each panel undertook, and some analysis of the results within a panel context		√
Project Report: PBRF 2018 Quality Evaluation	**Outlines the process the TEC undertook to implement the 2018 Quality Evaluation**		**√**
KPMG Performance-Based Research Fund Audit Report	Independent assurance that the Guidelines have been consistently and correctly applied		√
Quality Evaluation results and demographics applications available via Ngā Kete	Allows TEOs to analyse their results through the TEC's Ngā Kete platform. There are two: 1. Quality Evaluation (PBRF) – Final Results 2. Quality Evaluation (PBRF) – Researcher Demographics	√	
Quality Evaluation results interactive charts	Allows the public to view high-level results of individual TEOs, subsectors and the whole sector		√
Infographics	Overview of the results by subsector and across the four Quality Evaluation rounds (2003, 2006, 2012 and 2018)		√
Data visualisations	Traces knowledge pathways by looking at researcher collaboration and the reach of research outputs		√

Process insights

In the PBRF 2018 Quality Evaluation:

- 36 TEOs participated, compared to 27 TEOs in 2012
- 14 ITPs, 12 PTEs, all eight universities, and two wānanga participated
- 8,269 EPs were submitted compared to 7,334 in 2012
- 141 researchers claimed Canterbury extraordinary circumstances, and 235 claimed general extraordinary circumstances
- assessment was done by 266 panellists (comprising three Moderation Panel members and 263 peer-review panellists); 195 panellists were New Zealand based and 71 were from overseas.

36 TEOs participated in 2018 compared with **27** TEOs in 2012

2 wānanga
8 universities
12 PTEs
14 ITPs

8,269 EPs **submitted** compared to 7,334 in 2012

141 researchers claimed Canterbury extraordinary circumstances, and **235** claimed general extraordinary circumstances

Assessment was done by **266 panellists** (comprising three Moderation Panel members and 263 peer-review panellists); **195** panellists were New Zealand based and **71** were from overseas.

Changes this round

Informed by the Sector Reference Group (SRG) recommendations following the PBRF 2012 Quality Evaluation, several changes were made to the 2018 Quality Evaluation. Some of these changes, such as reducing the number of research outputs and research contributions, aimed to simplify the process and reduce TEO transaction costs. Other changes included establishing a Pacific Research Panel and increasing the weighting for new and emerging researchers. (See page 8 for more information on changes to the 2018 Quality Evaluation.)

TEO audit

Following a competitive procurement process, KPMG was appointed as the auditor for the 2018 Quality Evaluation. They audited:

- TEO staff eligibility
- new and emerging status of staff
- submitted research outputs and research contributions.

Where errors were found, depending on the severity, the TEC acted to either correct the error, or, where necessary, removed research outputs or research contributions that were deemed ineligible.

The auditors found two main sources of error for research outputs:

- research outputs that were identical or like outputs submitted in the 2012 Quality Evaluation
- research outputs that were published outside of the assessment period.

Overall, the auditors found that the Guidelines had been consistently and correctly applied by all participating TEOs.

See *Appendix 1: Further readings* for more information about the TEO audit process and findings.

Process assurance review

Cook & Associates Limited was engaged to provide assurance over the design and operation of the 2018 Quality Evaluation. The auditor was satisfied that the design and operation of the

process, and interim reporting on it were consistent with the Guidelines. The Process Assurance review identified no significant issues likely to adversely affect the objectives of the PBRF 2018 Quality Evaluation.

See *Improving Research Quality: The results of the PBRF 2018 Quality Evaluation* for the Process Assurance Audit letter.

The PBRF – an overview

The Performance-Based Research Fund (PBRF) is designed to encourage and reward excellent research in New Zealand's degree-granting organisations.

The fund was introduced in 2002 to replace an equivalent full-time student (EFTS)-based top-up system that funded research relative to the number of learners. After investigating international examples, the fund was developed to include peer-based assessment and performance indicators. The fund has three components:

- Quality Evaluation (55%) – run periodically (typically every six years), funding is determined by peer evaluation of individual research portfolios (referred to as Evidence Portfolios or EPs).
- Research Degree Completion (RDC) (25%) – measured annually, funding is based on the number of postgraduate degrees completed at a participating TEO.
- External Research Income (ERI) (20%) – measured annually, funding is based on the amount of external funding received for research purposes.

All New Zealand-based TEOs with degree-granting authority to teach degree-level courses that are in receipt of Student Achievement Component (SAC) funding are entitled to participate in the PBRF Quality Evaluation process. To receive PBRF funding, TEOs are required to participate in all three components of the PBRF.

The PBRF in context

Before the PBRF, research in the tertiary education sector was funded through EFTS subsidies, with top-up funding targeted at research degrees.

This EFTS-based funding model had three weaknesses: not providing the stability necessary for longer-term investigative work; rewarding providers for student numbers rather than research quality; and not providing consistent, comparable information about the quality of research. A new approach was needed, and in November 2001, the Tertiary Education Advisory Commission recommended the introduction of a performance-based research fund.

The primary objectives of the PBRF are to:

- increase the quality of basic and applied research at New Zealand's degree-granting TEOs
- support world-leading teaching and learning at degree and postgraduate levels
- assist New Zealand's TEOs to maintain and lift their competitive rankings relative to their international peers
- provide robust public information about research performance within and across TEOs.

In doing so, the PBRF also supports:

- the development of postgraduate student researchers and new and emerging researchers
- research activities that provide economic, social, cultural, and environmental benefits to New Zealand, including the advancement of Mātauranga Māori
- technology and knowledge transfer to New Zealand businesses, iwi and communities.

Assessing research performance

The Quality Evaluation is an assessment of the research performance of eligible TEO staff, over a fixed period, at participating TEOs. TEOs determine which staff members are eligible to participate and whether their research is likely to receive a funded Quality Category. EPs from these staff members are then compiled and submitted through the TEC's PBRF IT System. EPs that are not likely to meet these requirements are not submitted for assessment. TEOs also submit demographic, employment and academic information for these staff. All data are stored securely and confidentially in the PBRF IT System.

At the close of the submission process, the TEC audits the data to ensure that staff and research meet the eligibility criteria and the information is accurate.

Changes to the 2018 Quality Evaluation

After each Quality Evaluation, the Ministry of Education has led a policy review of the fund. Cabinet accepted the recommendations made following the 2012 Quality Evaluation review.

The TEC then formed a Sector Reference Group (SRG) to provide advice and recommendations on what further changes were to be made to the design of the PBRF (specifically the Quality Evaluation). These recommendations were incorporated into the Guidelines. The SRG's recommendations included:

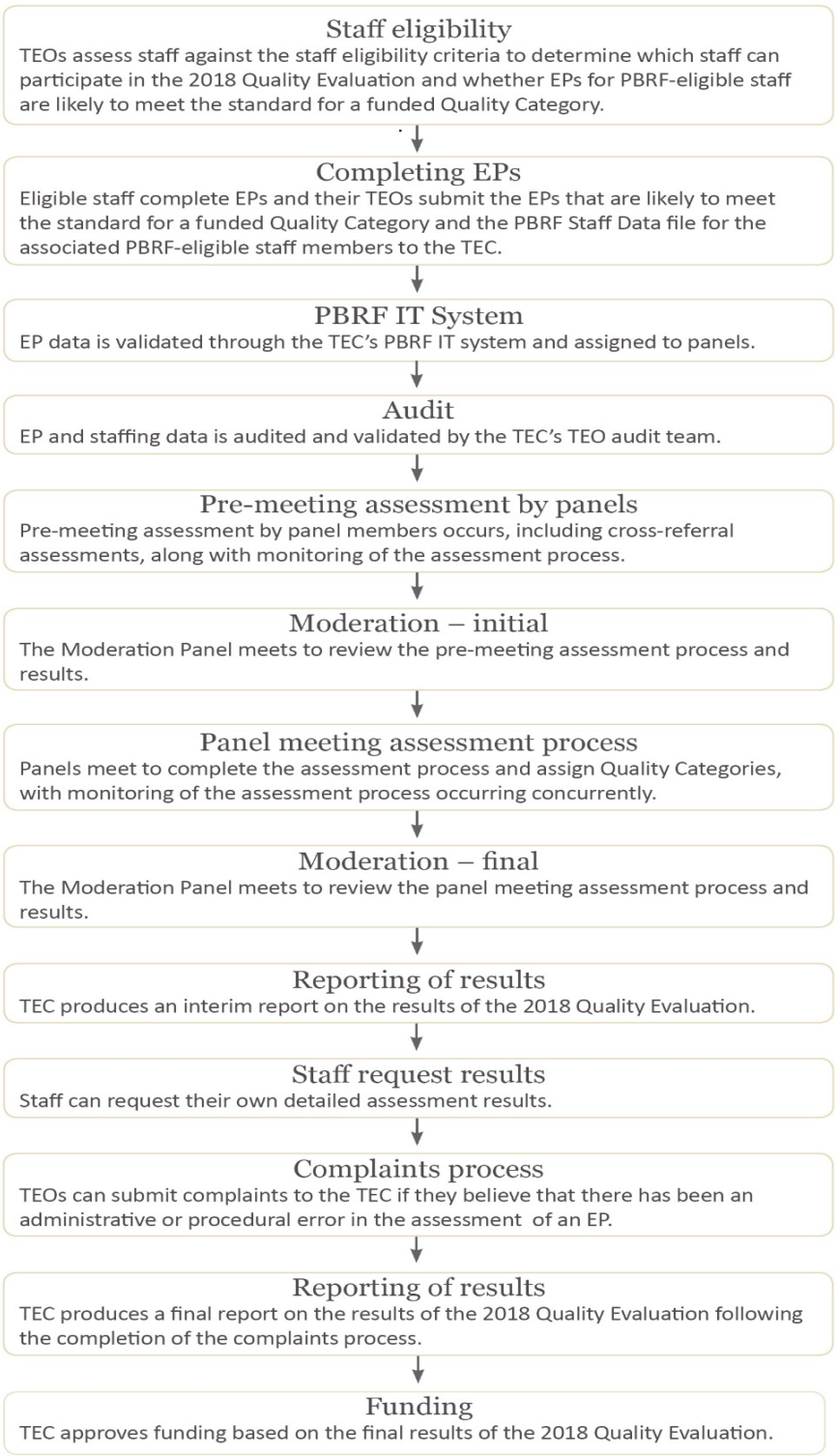
- reduce TEO transaction costs and simplify the process
- incentivise the recruitment, development and retention of new and emerging researchers to support a sustainable research workforce
- strengthen reporting by using fewer measures.

Cabinet accepted these recommendations and implemented changes to the Quality Evaluation that included:

- combining the Contribution to the Research Environment and Peer Esteem components into a single Research Contribution component
- reducing the maximum number of other research outputs (OROs) from 30 to 12
- reducing the maximum number or research contributions from 60 to 15
- excluding overseas-based staff from participating
- tightening special circumstances criteria and changing these to extraordinary circumstances
- discontinuing specialist advisors and expert advisory groups (except for the Special Advisor – extraordinary circumstances[1])
- increasing the weighting for new and emerging researchers
- establishing a Pacific Research Panel.

[1] The SRG agreed to appoint a Special Advisor – extraordinary circumstances. This role was to monitor the effectiveness of the extraordinary circumstances provision through the moderation of the assessment process, and to support the Moderators and peer-review panels in the assessment of general and Canterbury extraordinary circumstances.

Figure 1: The stages of the PBRF 2018 Quality Evaluation process



The Quality Evaluation submission process

This section provides you with an overview of the submission process, a summary of the submissions of participating TEOs, and what happened to ensure the integrity of the submissions.

An overview of the submission process

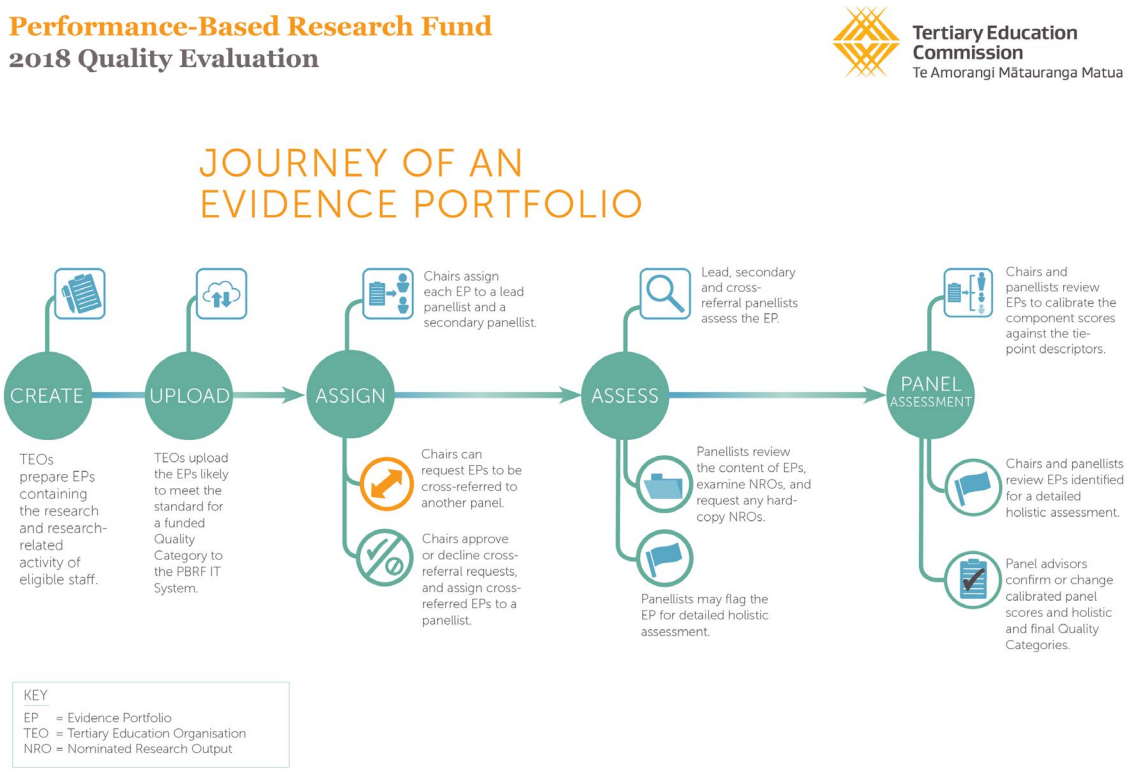
For the 2018 Quality Evaluation, participating TEOs determined staff eligibility. If staff members were eligible, the TEOs considered whether their research was likely to meet the standard for a *funded* Quality Category.

TEOs then compiled individual EPs for staff they selected to include. Each EP contained information on a staff member's research and research-related activities during the assessment period (the previous six-year period from 1 January 2012 to 31 December 2017).

EPs were submitted to the TEC through the PBRF IT System.

Submitted EPs were audited to ensure that staff met the eligibility criteria.

Figure 2: Journey of an Evidence Portfolio



The 2018 Quality Evaluation submission

Thirty-six TEOs participated in the 2018 Quality Evaluation, including 14 institutes of technology and polytechnics (ITPs), 12 private training establishments (PTEs), all eight universities, and two wānanga. This compares to 27 TEOs in 2012. See *Improving Research Quality: The results of the PBRF 2018 Quality Evaluation* for the list of participating TEOs.

Participating TEOs uploaded EPs and staff data through the PBRF IT System. The system was open to TEOs from 5 July 2017 to 14 July 2018.

For the 2018 Quality Evaluation, 8,269 EPs were submitted.

Ensuring the integrity of the submission process

For the 2018 Quality Evaluation, we offered TEO training and support, such as a series of webinars, drop-in sessions in main centres, and regular newsletters.

The PBRF 2018 Quality Evaluation was supported by a comprehensive compliance audit programme. Following a competitive procurement process, KPMG was appointed for the TEO audit process for the 2018 Quality Evaluation. The audit process is described below.

Pre-submission TEO audit

The process assurance phase of the TEO audit involved assessing the processes each TEO had in place to conform to the Guidelines. Overall, all participating TEOs put adequate processes in place to implement the Guidelines consistently and correctly.

Minor inconsistencies were identified in some areas and are discussed in *Performance-based Research Fund Summary Report: Process Assurance.*

See *Appendix 1: Further readings* for more information about the TEO audit process and findings.

Post-submission data evaluation

The purpose of the data evaluation phase of the TEO audit was to ensure the Guidelines had been consistently and correctly applied by all participating TEOs.

For this phase, the TEO auditors examined:

- staff eligibility by auditing a sample of 15.6% of all staff who submitted EPs
- new and emerging researchers by auditing all staff who were identified by TEOs as new and emerging
- research outputs by auditing a sample of approximately 7% of nominated research outputs (NROs)
- research contributions by auditing a sample of 1% of research contributions
- TEO processes for considering, endorsing and validating extraordinary circumstance claims.

The TEO auditors found two main sources of error for research outputs:

- research outputs that were identical or similar to outputs submitted in the 2012 Quality Evaluation
- research outputs that were published outside of the assessment period.

However, overall the TEO auditors found that the Guidelines had been consistently and correctly applied by all participating TEOs.

Panellists could raise audit concerns where they had questions or concerns over the accuracy and reliability of any EP information. These concerns could first be raised with the TEC Panel Advisor for advice and clarification. Audit concerns were escalated to the TEO auditors as required.

See *Appendix 1: Further readings* for more information about the TEO audit process and findings.

Peer-review panels

This section provides you with an overview of the peer-review panel process, a summary of the actions taken at the different stages of the assessment process, and what happened to ensure the integrity of the assessment.

An overview of the panel process

TEOs nominated a peer-review panel and subject area for each EP submitted to the 2018 Quality Evaluation. Each researcher's EP was assessed by at least two peer-review panel members before being reviewed by the full panel.

Panel selection

Panellists were selected based on their expertise and knowledge. Panellists did not act as representatives of their employer or discipline.

There was a two-stage nomination process for membership in the 2018 Quality Evaluation peer-review panels. The first stage closed in September 2015 with the appointment of Chairs and an initial cohort of panellists to develop panel-specific guidelines. Nominations for the second stage closed on 26 February 2018.

Panels were publicly announced in May 2018, although some unavoidable changes were made following this announcement. The TEC updated TEOs on these changes and maintained an updated list on the TEC website.

Composition and size of panels

To help in establishing the panels, the following assumptions were made:

- Participating TEOs would submit an estimated 8,000 EPs. The actual number of EPs submitted was 8,269.
- There would be a similar distribution of EPs by subject area as applied in the 2012 Quality Evaluation.
- Estimating 35 EPs per panellist as lead assessor would be used to calculate the total number of panellists needed. The average number of EPs assigned per panellist as lead assessor for the 2018 Quality Evaluation was 31.[2]
- The new Pacific Research Panel would receive up to 120 EPs to assess. The number of EPs received by the Pacific Research Panel was slightly less than half this number; however, the Pacific Research Panel also accepted 112 cross-referrals to assess either the whole, or a selected part, of an EP.
- The goal was to have two panellists with knowledge and expertise in any given subject area, although this was not always achieved due to specialisation of subject knowledge in some areas.

Panels ranged in size from nine panellists on the Pacific Research Panel to 32 panellists on the Medicine and Public Health Panel. The average panel had just over 20 members.

---

[2] This number was used as a proxy and does not reflect actual workload of individual panellists. Each EP was assigned to two panellists for pre-panel assessment, one as lead and one as secondary assessor. In addition, many panellists were asked to provide a cross-referral assessment on whole or selected parts of one or more EPs. Workload also varied by subject-matter expertise.

TEOs were asked to indicate NROs that would be submitted in languages other than English or te reo Māori, so that we could plan for resource in panels. TEOs were notified that while some panels, such as the Pacific Research Panel, might have capacity and expertise to assess research in other languages, this could not be assumed for all panels.

Efforts were made to ensure that panels had an appropriate balance of:

› gender

› new and previous members

› overseas and New Zealand-based members

› representation from a range of TEO types and non-TEOs.

There was also a concerted effort to ensure panel representation included:

› applied/practice-based researchers

› early career researchers

› interdisciplinary researchers

› Māori researchers

› Pacific researchers.

Good gender balance was achieved **across** panels in general, although not **within** certain panels. Despite ongoing efforts and targeted recruitment, there were not large numbers of nominees from institutes of technology and polytechnics, wānanga or industry.

See the *Report of the Moderation Panel and the Peer-Review Panels* for panel membership.

Table 2: Panel size and the number of EPs that each panel assessed

PANEL	# OF PANEL MEMBERS	NUMBER OF EPs
Biological Sciences	24	787
Business and Economics	25	857
Creative and Performing Arts	19	538
Education	17	588
Engineering, Technology and Architecture	24	771
Health	24	615
Humanities and Law	22	666
Māori Knowledge and Development	10	188
Mathematical and Information Sciences and Technology	17	562
Medicine and Public Health	32	1,210
Pacific Research	9	60
Physical Sciences	14	549
Social Sciences and Other Cultural/Social Studies	26	878
TOTAL	**263**	**8,269**

Note: this table does not include cross-referred EPs.

Ensuring the integrity of the panel process

A Moderation Panel – comprised of a Principal Moderator, two Deputy Moderators and the 13 panel Chairs – was established to ensure that standards were consistent across panels and that the Guidelines were properly followed.

We also appointed a Special Advisor for extraordinary circumstances. The purpose of this role was to monitor the effectiveness of the extraordinary circumstances provision through the moderation of the assessment process, and to support the Moderators and peer-review panels in the assessment of general and Canterbury extraordinary circumstances.

Panellists were required to undertake training before assessing EPs. This training included understanding the assessment process, how to manage unconscious biases, and how to calibrate against scoring descriptors. See the *Assessment process* section for more information.

As in previous Quality Evaluations, we established and adhered to conflict of interest and complaints processes, as well as a confidentiality policy.

The panels were supported by TEC Panel Advisors who provided technical, process and administrative advice, as well as monitoring the assessment process.

Assignment of EPs

From 14 July to 27 August 2018, panel Chairs assigned each EP to two panellists, matching expertise and knowledge to EP subject area, while considering conflicts of interests. See the section *Ensuring the integrity of the panel process* for more information on addressing conflicts of interest.

On average, each panellist assessed 62 EPs as either lead, secondary or cross-referral assessor.

Transferring EPs

Participating TEOs selected a panel, subject area, and primary field of research for each EP submitted to the TEC. Panel Chairs reviewed this information for EPs assigned to their panel. Panel Chairs also considered identified conflicts of interest and NROs to determine the assignment or possible transfer of an EP to another panel.

Panel Chairs could request that the TEC transfer[3] an EP to another panel for several reasons, including:

- the primary subject area of research fell within the coverage of another panel
- a conflict of interest existed within the primary panel that could not be resolved within the primary panel
- the relevant subject-area expertise resided in a different panel.

The TEC would transfer an EP to another panel based on the recommendation of the panel Chair. If required, advice could be sought from other panel Chairs, a Moderator, or both. The TEC made the final decision on EP transfers and recorded the reason for the transfer.

The TEC approved transfer requests for 107 EPs. Table 3 breaks this down by the panel requesting the transfer and which panel(s) the EPs were transferred to.

[3] In the 2018 Quality Evaluation, an EP "transfer" meant when an EP was moved from the panel originally selected by the submitting TEO to another panel, as recommended by the panel Chair. A "cross-referred" EP meant when more than one panel assessed all, or specific components, of an EP.

Table 3: Number of EPs transferred by panel

TRANSFERRING PANEL	NUMBER OF EPs TRANSFERRED	TRANSFERRED TO THESE PANELS
Biological Sciences	43	Business and Economics; Engineering Technology, and Architecture; and Medicine and Public Health
Creative and Performing Arts	16	Business and Economics; Education; Engineering, Technology and Architecture; Health; Humanities and Law; Mathematical and Informational Sciences and Technology; Medicine and Public Health; and Social Sciences and Other Cultural/Social Studies
Education	8	Creative and Performing Arts; Health; Humanities and Law; and Social Sciences and Other Cultural/Social Studies
Engineering, Technology and Architecture	24	Mathematical and Informational Sciences and Technology; and Physical Sciences
Health	2	Medicine and Public Health
Humanities and Law	7	Business and Economics; Creative and Performing Arts; Medicine and Public Health; and Social Sciences and Other Cultural/Social Studies
Māori Knowledge and Development	1	Pacific Research
Medicine and Public Health	2	Health
Social Sciences and Other Cultural/Social Studies	4	Business and Economics; Creative and Performing Arts; and Medicine and Public Health

The newly assigned panel was then responsible for assessing and reporting on the EP. The EP could be cross-referred to the original panel for additional input if the panel Chairs agreed that this was required.

TEOs will be notified if an EP was transferred to another panel as part of the reporting of results. The notification will include the reason for the transfer.

EP cross-referrals

TEOs could not request a cross-referral assessment except to the Māori Knowledge and Development Panel and the Pacific Research Panel (through completing the Māori and/or Pacific Research elements of an EP). The primary panel Chair could choose to cross-refer an EP to another panel, specifying whether the whole EP or just a component of the EP was to be assessed. In addition, panellists could request that their Chair consider cross-referring all, or a component, of an EP to another panel.

The cross-referral panel Chair could accept or reject the cross-referral. If an EP was declined for a cross-referral, it would stay with its original panel for assessment.

In the 2018 Quality Evaluation:

- 276 EPs were cross-referred to the Māori Knowledge and Development Panel with 78 accepted for assessment
- 171 EPs were cross-referred to the Pacific Research Panel with 112 accepted for assessment
- 73 EPs were cross-referred to other panels, by Chairs, with 63 accepted for assessment.

For more information about assignment and cross-referral of EPs see the *Report of the Moderation Panel and the Peer-Review Panels*.

Assessment process

In this section you will learn about the assessment process, including the scoring system.

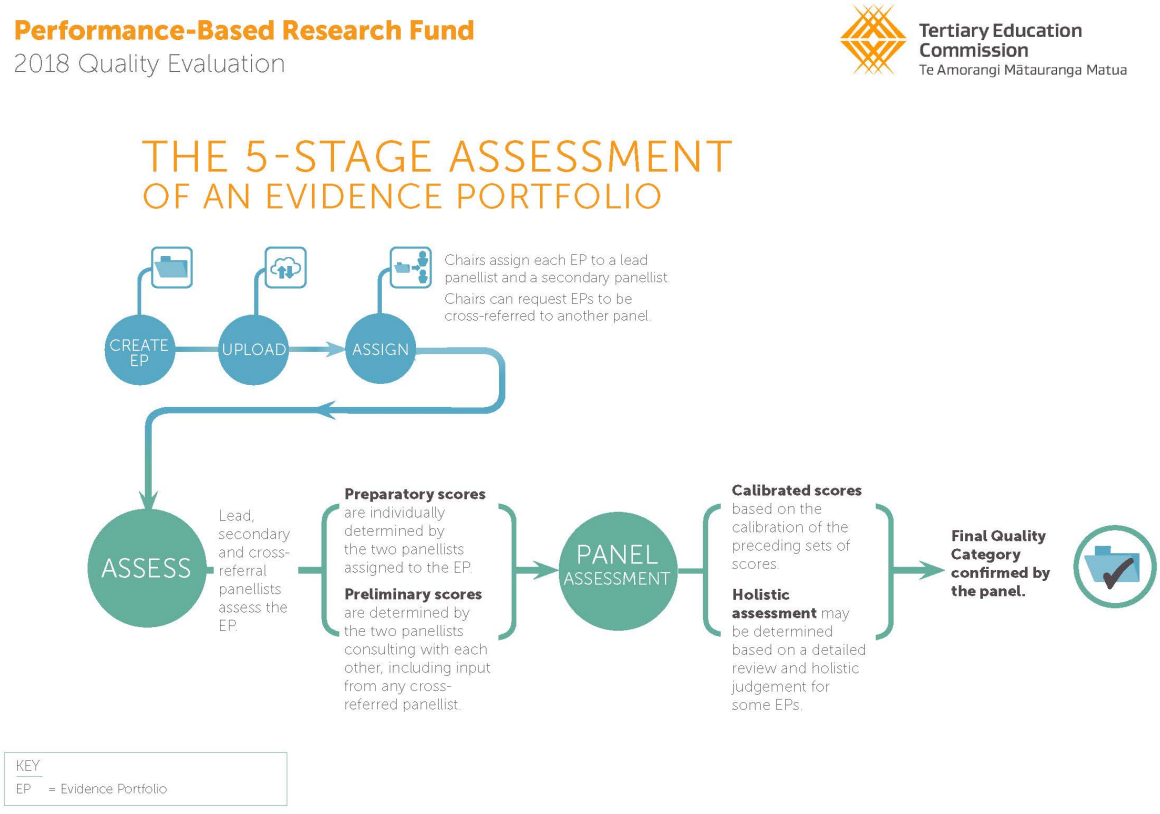
The Quality Evaluation is a standards-based assessment process, with scoring based on descriptors and tie-points articulated in the Guidelines. These standards apply to every panel and are supported by panel-specific guidelines.

Scoring system

The scoring system has the following characteristics:

- Each component of an EP (Research Output and Research Contribution) is scored on a scale from 0 (the lowest) to 7 (the highest).
- Assessors use the descriptors and tie-points for each of the two components to score. The tie-point descriptors at scores of 2, 4, and 6 distinguish the boundaries between Quality Categories.
- A score of 0 indicates that no evidence has been provided for that component.

Figure 3: The five-stage assessment of an Evidence Portfolio



Pre-meeting assessment and scoring

Panel Chairs assigned each EP to two panellists (a panel-pair) for pre-meeting assessment and scoring. In allocating EPs to panellists, the Chair considered:

- the expertise of the panellists in the subject areas in which the staff member was being assessed
- any declared conflicts of interest
- balancing the workload across the panel.

Panel Chairs designated one member of the panel-pair as lead for that EP. The lead panellist coordinated the discussion with the other assigned panellist, checked (if applicable) cross-referral scores and comments, and led any discussion on the assigned EP at the panel meeting.

Calibrating scores

Panellists received training and ongoing support to ensure they each had a clear understanding of the scoring system.

Calibrating scores is important to the Quality Evaluation process as it:

- supports consistency
- ensures scores are based on Quality Category descriptors
- ensures the Quality Evaluation is, and is seen to be, robust, fair and objective.

For each assigned EP, panellists first determined and recorded preparatory scores for both the Research Output and Research Contribution components within the PBRF IT System. The preparatory scores were determined independently of any other member of the panel.

As part of the assessment, panel-pairs were expected to examine at least 50% of the NROs listed in the EPs assigned to them. Each panel identified its own target, and all examined more than 50%.

In the 2018 Quality Evaluation, 31,619 NROs were examined, or 96.0% overall. See Table 4 for information on how many NROs were submitted and were accessed by panel.

We note that in a small number of instances, NROs could not be assessed due to evidence not being correctly submitted. See the *Further discussion and next steps* section.

Table 4: NROs submitted and percentage examined by panel

PANEL NAME	TOTAL NROs	PERCENTAGE OF NROs EXAMINED
Biological Sciences	3,131	99.8%
Business and Economics	3,406	95.2%
Creative and Performing Arts	2,146	98.7%
Education	2,345	98.3%
Engineering, Technology and Architecture	3,071	99.9%
Health	2,448	96.5%
Humanities and Law	2,661	91.2%
Māori Knowledge and Development	742	97.7%

PANEL NAME	TOTAL NROs	PERCENTAGE OF NROs EXAMINED
Mathematical and Information Sciences and Technology	2,233	98.5%
Medicine and Public Health	4,820	93.8%
Pacific Research	234	98.7%
Physical Sciences	2,187	92.2%
Social Sciences and Other Cultural/Social Studies	3,506	92.7%

The panel-pair then discussed the preparatory scores they had given to the EP and recorded agreed-upon preliminary scores for that EP.

After panellists entered their preliminary scores into the system, weightings were automatically applied to the components, and an indicative Quality Category was derived for the EP as shown in Table 5. EPs from new and emerging researchers were automatically weighted so that if the Research Output score was 2 or higher, the EP would receive a C(NE) Quality Category even without the Research Contribution component.

Table 5: Indicative Quality Categories determined at the preliminary score stage

TOTAL WEIGHTED SCORE	QUALITY CATEGORY
600 to 700	A
400 to 599	B
200 to 399	C or C(NE)
Less than 200	R or R(NE)

If the EP was cross-referred to another panel, the panel-pair included the cross-referral assessor in the discussion to determine the preliminary component scores in all cases where a difference in scoring could have had an impact on the Quality Category result.

If agreement could not be reached on the preliminary scores, the lead panel member identified the EP as “decline to score” in the PBRF IT System, so that the EP would be flagged for detailed discussion at the calibrated panel component score stage at the panel meeting. For the 2018 Quality Evaluation, there were 27 EPs that received a “decline to score” at the preliminary scoring stage.

Panel meeting assessment and scoring

The final stages of the assessment process occurred during panel meetings. Each panel meeting was held for three to five days (depending on the number of EPs a panel had been assigned to assess) between mid-November and early December 2018.

During the panel meeting, panellists discussed and agreed on calibrated panel component scores for every EP assigned to the panel. These scores were then recorded in the PBRF IT System. The panel also determined the calibrated panel component scores for any EPs where the panel-pair declined to score at the preliminary scoring stage. For more detail on the calibration exercise used to ensure integrity see the section below.

The PBRF IT System calculated a calibrated panel Quality Category for each EP based on the calibrated panel component scores.

Panels undertook a holistic assessment to determine that when all relevant information from an EP was considered the calibrated panel Quality Category awarded was:

› consistent with the Quality Category descriptors

› similar in quality compared to other EPs awarded the same Quality Category.

Panels provided a *detailed* holistic assessment for EPs that claimed extraordinary circumstances. Panels could also flag EPs for a detailed holistic assessment if they identified any uncommon issues about the EP. These issues might include specific quantity or quality issues, or scoring concerns, such as a noticeable difference between the Research Output component and the Research Contribution component scores.

Table 6: Increases to calibrated panel Quality Category scores following detailed holistic assessment

EPs FLAGGED FOR DETAILED HOLISTIC ASSESSMENT	THE NUMBER OF CALIBRATED PANEL QUALITY CATEGORY SCORES THAT INCREASED FOLLOWING DETAILED HOLISTIC ASSESSMENT					
	B	C	C(NE)	R	R(NE)	TOTAL
EPs with only general extraordinary circumstances	11	26	1	6	1	**45**
EPs with only Canterbury extraordinary circumstances	8	11	0	3	0	**22**
EPs with both Canterbury and general extraordinary circumstances	6	4	0	2	0	**12**
EPs with no extraordinary circumstances	38	8	1	8	3	**58**
TOTAL	**63**	**49**	**2**	**19**	**4**	**137**

Note: no EPs received a lower Quality Category following detailed holistic assessment.

Following the determination of holistic Quality Categories, panels confirmed the final Quality Category recorded in the PBRF IT System for each EP.

Ensuring the integrity of the panel process

Conflicts of interest

Identifying and managing any conflicts of interest or potential conflicts of interest between assessors and submitting researchers was an important part of maintaining assessment integrity. There were two ways that conflicts of interest could be notified:

› Panellists noted any conflicts they had through the PBRF IT System. These could be with individuals or a department.

› Researchers, through their TEO, submitted a conflict notice to us and we updated the PBRF IT System. We kept TEOs informed of who was on each panel, and any changes that occurred through the process.

In addition, panellists could raise conflicts of interest during their panel meeting where they had not identified them previously.

Chairs checked identified conflicts when assigning EPs and determined what action to take. For a full description of the reporting and management of conflicts of interest see the Guidelines and the *Report of the Moderation Panel and the Peer-Review Panels*.

Where a Chair had a conflict of interest, we reported this to the Principal Moderator and the appropriate TEC Panel Advisor, with the latter recording any actions undertaken.

If we had determined that any panellist had conflicts of interest at a level that would seriously compromise a fair, impartial and effective evaluation process, we reserved the right to stand-down the panellist. This did not occur in the 2018 Quality Evaluation.

The Quality Evaluation Process Assurance Review auditor evaluated all conflicts, planned actions and provided feedback.

During the panel meetings, the TEC Panel Advisors read out the names of panellists who had a conflict recorded against the EP being discussed.

Scoring calibration

Calibration in this context means the checking and adjusting of scores to ensure that they are consistent with the standards, and that these standards are being applied consistently within and across panels. This was achieved in several ways throughout assessment.

Panels did a thorough calibration exercise as part of their online training, where they familiarised themselves with the descriptors and then scored a set of exemplar EPs. This was followed by a discussion and whole-panel calibration exercise during face-to-face training. Chairs conducted individual sessions for the few panellists who did not attend this training. Results of these exercises showed a high level of consistency between and within panels.

Moderation

The PBRF IT System allowed us to monitor and moderate assessment throughout the process.

At the individual assessment stage, Chairs received real-time analysis of individual and pair scores, so they could see inconsistencies within their panels. Moderators received this information across panels. We also monitored and reviewed any concerns raised by panellists, and updated Chairs and Moderators when necessary.

The next moderation check was during initial moderation panel meetings, which included Moderators, Chairs and Panel Advisors. In these meetings Chairs:

- used statistical analysis reports (standard deviations, standard errors and score distributions) to identify issues and ensure assessment consistency
- paid attention to the assessment of new and emerging researchers, applied or practice-based research, or unusual/uncommon types of research outputs
- examined any issues raised
- compared indicative Quality Categories to those of the previous Quality Evaluation.

During the panel meetings, Moderators received daily reports that showed:

- Quality Categories that changed between the preliminary score and the calibrated panel score
- Quality Category changes at the holistic assessment stage and how extraordinary circumstances were considered

› distribution of Quality Categories by panel and subject area, as well as across Quality Evaluations.

Moderators were present during all days of the panel meetings, and each of them attended parts of each panel meeting.

The last step in moderating the assessment was the final moderation panel meeting, which was held in December 2018 following the panel meetings. During this meeting, the following items were considered:

› outliers, such as in subject areas and panels

› whether, and how much, panels departed from preliminary scores

› comparisons of aggregate Quality Category distributions across the 2003, 2006, 2012 and 2018 Quality Evaluations.

. While a panel can be reconvened should the need arise from either the moderation or complaints process, this was not required for the PBRF 2018 Quality Evaluation.

Process assurance review

Cook & Associates Limited was engaged to provide assurance over the design and operation of the 2018 Quality Evaluation. The auditor provided real-time assurance, attending meetings and working with the panels, Moderators and the project team to resolve issues as they arose.

Cook & Associates Limited was satisfied that the Quality Evaluation was carried out consistently with the Guidelines.

Further discussion and next steps

In this section we outline areas for discussion and improvement for any future Quality Evaluation rounds.

The list below includes some of the feedback from the Moderators, panel Chairs, participating TEOs and the TEC project team. Additional recommendations and areas that need further discussion can be found in the *Report of the Moderation Panel and the Peer-Review Panels*.

Points for further discussion

EP submission

- Some EPs contained research outputs that did not meet the definition of research and were assessed accordingly.
- NROs must contain research in a form that allows panellists to make a fair assessment of the quality. For example, a reviewer cannot assess the quality of a book only on its table of contents and bibliographic information.
- For some TEOs, there was confusion over the two fields Main Research Object URI and Main Research Object Location; the latter was intended only as a field for use when a physical object was the assessment item. More clarity on this should be provided for any future Quality Evaluation rounds.
- Some outputs did not contain enough new research from a previously submitted version to constitute a new research output. For example, addenda to previously published journal articles, or a book or chapter drawing heavily on previously published material. In such cases, researchers sometimes failed to specifically explain what the new research elements were.
- The contextual summary was not always cohesive and coherent. This section should explain where research sits in the wider research environment and should link clearly to the outputs submitted. More training on this would be helpful for any future Quality Evaluation rounds.
- Submissions of NROs in languages other than English or te reo Māori were an area of challenge for some panels. The most affected panel was Humanities and Law, which received around 100 NROs in foreign languages. It is difficult to find panellists with a mix of subject expertise and language. This issue may become more challenging in any future rounds as collaboration and internationalisation continues in research.

Technical issues

- For TEOs, a thorough checking process should be in place to ensure uploaded NRO files are of good technical quality, readable and contain all the information needed for assessment. In a small number of instances, some uploaded NROs were technically invalid.

Cross-referrals with Māori and Pacific research elements

- A large percentage (72.0%) of EPs were declined for cross-referral by the Māori Knowledge and Development Panel. The Chair of this panel noted that many of these EPs did not contain the elements of Māori research that would have warranted cross-referral to the panel. For any future rounds, additional training and clarity should be provided for researchers, TEOs and panellists on what constitutes Māori methodologies.

› Similarly, although not as significantly, 34.0% of EPs to the Pacific Research Panel were declined.

Research contributions

› More training is required on describing what research contributions are particularly in the areas of uptake and impact.

› Researchers should be encouraged to group like types of research contributions to avoid repetition, to categorise correctly, and to show a range of research contribution types.

Staff eligibility

› The new and emerging category for staff was one that TEOs found arduous to determine and provide evidence for. In some cases, staff were miscategorised as new and emerging. A review of this category is recommended for any future rounds.

Diversity within panels

We did not achieve desired diversity for all panels in the following areas:

› non-university representation

› Māori and Pacific representation.

Within certain panels we also did not achieve a good gender balance.

We need to identify ways to increase representation of these groups for any future Quality Evaluations. See the *Report of the Moderation Panel and Peer-Review Panels* for a more detailed discussion on this topic.

Next steps

The periodic review of the PBRF is underway. It will examine the ways that the government can continue to support research excellence by improving the effectiveness and efficiency of PBRF administration and ensuring that it delivers solid outcomes for learners, businesses, communities and New Zealand as a nation.

The reporting outputs for the PBRF 2018 Quality Evaluation and feedback received from participating TEOs, panellists and other stakeholders will feed into this process.

Appendix 1: Further reading

Reporting outputs for the PBRF 2018 Quality Evaluation are listed in Table 1.

2018 Quality Evaluation Guidelines

Guidelines for tertiary education organisations participating in the 2018 Quality Evaluation (PDF, 2.39 Mb)

Guidelines for the 2018 Quality Evaluation assessment process (PDF, 2.27 Mb)

A guide for staff members participating in the 2018 Quality Evaluation (PDF, 1.49 Mb)

Panel-Specific Guidelines for the 2018 Quality Evaluation (PDF 1.7 Mb)

Audit reports

Performance-based Research Fund Summary Report: Process Assurance (PDF, 657 Kb)

Audit Methodology for PBRF 2018 Quality Evaluation (PDF, 945 Kb)

Peer-review panels

Peer Review Panel nomination and selection process for the 2018 Quality Evaluation (PDF, 415 Kb)

PBRF Sector Reference Group

Terms of Reference

Links to the PBRF Sector Reference Group (SRG) consultation papers and recommendations can be found on the TEC website.

Overview of the PBRF

PBRF User Manual V4 (PDF, 1 Mb)

Appendix 2: Glossary

Below are common terms used in the PBRF 2018 Quality Evaluation and in this report. A more comprehensive glossary is available in the Guidelines.

Common terms

TERM	MEANING
Evidence Portfolio (EP)	TEOs collect information on the research outputs and research-related activity of their PBRF-eligible staff members during the assessment period. This information forms the basis of an EP that is submitted by the TEO to the TEC for assessment by a peer-review panel.
Moderation Panel	The panel that meets to review the work of peer-review panels to ensure that the TEC policy has been followed and the Quality Evaluation process has been consistent across the panels. The Moderation Panel for the 2018 Quality Evaluation included the Principal Moderator, two Deputy Moderators and the 13 panel Chairs.
New and emerging researcher (NE)	An eligible researcher undertaking substantive and independent research for the first time in their career. See the Guidelines for a full description.
Nominated Research Outputs (NROs)	The best research outputs that the researcher includes in their Evidence Portfolio are referred to as nominated research outputs (NROs). NROs are given particular scrutiny during the Quality Evaluation process. There can be up to four NROs in an EP.
Other Research Outputs (OROs)	The other research outputs that the researcher includes in their Evidence Portfolio if they have four nominated research outputs (NROs). OROs form evidence of the staff member's platform of research. There can be up to 12 OROs in an EP.
Peer-review panel	Group of experts who evaluate the quality of research as set out in an individual Evidence Portfolio. There were 13 peer-review panels for the 2018 Quality Evaluation, each covering different subject areas.
Research Contribution component	A research contribution item is evidence that describes the contribution, recognition or impact of a staff member's research and research-related activities. This component is worth 30% of the overall score. There can be up to 15 research contribution items in an EP.
Research Output component	A research output is a product of research that is evaluated during the Quality Evaluation process. The Research Output component is one of the two components of an Evidence Portfolio.

Evidence Portfolio scoring terms

TERM	MEANING
Calibrated panel component scores	The Research Output and Research Contribution component scores of an EP that the panel agrees on during the panel meeting.
Calibrated panel Quality Category	The PBRF IT System calculates a calibrated panel Quality Category for each EP when a set of calibrated panel component scores are recorded.
Final Quality Category	The Quality Category for an EP confirmed by panels after the holistic assessment.
Holistic assessment	A Quality Category may be determined based on a detailed review and holistic judgement for some EPs as outlined in the Guidelines.
Indicative Quality Category	The Quality Category for an EP that is awarded based on the preliminary score.
Preliminary scores	The scores for an EP determined collectively by the panel-pair and any cross-referred panellists after consultation with each other.
Preparatory scores	The scores for an EP determined individually by each member of a panel-pair and any cross-referred panellists before consulting with each other.
Quality Category	There are six Quality Categories that can be awarded to an EP by a panel: A, B, C, C(NE), R and R(NE). A, B, C, C(NE) are funded Quality Categories and are reported on. R and R(NE) are not funded Quality Categories and are not reported on by the TEC.
Tie-points	The standards expected for the scores 2, 4 and 6 in each of the two components (Research Output and Research Contribution) of an EP.
Total weighted score	The sum of the points allocated to each component of the EP during the first stage of assessment, multiplied by the weighting for each component.