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This report has been prepared as outlined in the Scope in Appendix 1. The services provided in connection with this engagement comprise an advisory engagement, which is not subject to assurance or other standards issued by the Australian Auditing and Assurance Standards Board and, consequently no opinions or conclusions intended to convey assurance have been expressed.

This report is solely for the purpose set out in the Scope Section and for the Department of Education and the Office of Tasmanian Assessment, Standards and Certification’s information, and is not to be used for any other purpose or distributed to any other party without KPMG’s prior written consent.

This report has been prepared at the request of the Department of Education and the Office of Tasmanian Assessment, Standards and Certification in accordance with the terms of KPMG’s engagement letter/contract dated 11 January 2019. Other than our responsibility to the Department of Education and the Office of Tasmanian Assessment, Standards and Certification, neither KPMG nor any member or employee of KPMG undertakes responsibility arising in any way from reliance placed by a third party on this report. Any reliance placed is that party’s sole responsibility.
1. Executive Summary
1. Executive Summary

CONTEXT

On 18 December 2018 a correction and re-issuing of the Australian Tertiary Admission Ranking (ATAR) was required to be performed for all ATAR eligible Tasmanian students. This was as a result of a procedural error which had occurred in the derivation of tertiary entrance scores for some students who had undertaken the University of Tasmania High Achiever Program (HAP) and University Connections Program (UCP) units in 2018.

As a result of this issue, the Department of Education (the Department) has requested an internal audit be performed over the processes to calculate and report Tasmanian Certificate of Education (TCE) and ATAR scores for students with a particular focus on those studying HAP-UCP units. Consideration has been given to any validation checks over this process which may be in place.

SCOPE AND APPROACH

The scope of this internal audit was to:

- Consider the current processes and controls in place regarding importing and validating data in relation to tertiary entrance scores and ATAR results, focusing on scaling HAP-UCP results.
- Consider the processes for transferring results from Education Performance and Review (EPR) to the Office of Tasmanian Assessment, Standards and Certification (TASC) and any validation checks which may be in place.

The specific objectives and scope of this internal audit, as detailed in Appendix 1 to this report, were developed in response to the request received from the Department.

In performing this internal audit, the following approach was undertaken:

- Discussions were held with key staff from EPR and TASC to understand the issue which caused the incorrect values and to identify what validation checks are in place through the results calculation process.
- Compliance testing was performed over the validation checks currently in place.

It is noted that this internal audit report is on an exceptions basis, with only specific issues identified and opportunities for improvement reported. A summary of findings and recommendations identified through this project has been included in this Executive Summary.

BACKGROUND

The purpose of this internal audit was not to understand the root cause of the error which occurred, as this has already been performed by the Department. This internal audit has considered the broader risks and controls over the calculation of student results, including any validation procedures that are in place.

As noted in the context to this report, there are two areas which have responsibilities in the determination of student results and their TCE and ATAR scores:

- **TASC**: The Office of Tasmanian Assessment, Standards and Certification (TASC) is an independent statutory office responsible to the Tasmanian Minister for Education and Training. TASC is responsible (amongst other things) for the assessment and certification of student achievement in senior secondary schooling across all educational sectors in Tasmania.
- **EPR**: Education Performance and Review (EPR) is a unit within the Department of Education. EPR's responsibilities include managing senior secondary data from all school sectors on behalf of TASC and supporting their processes. This includes performing the calculation of senior secondary students’ results which are then provided to TASC to release to students.

The issue with student results that occurred in December 2018 resulted in a large amount of public interest in the results process. As the public face of this process, this has impacted the public perception, confidence in and reputation of TASC.
1. Executive Summary

OVERALL OBSERVATIONS

In conducting this internal audit, it was noted that there are a number of processes which need to be completed prior to releasing senior secondary student results. These processes need to be completed within a short timeframe, by a limited number of staff. These time pressures increased the likelihood that an error may occur which may not be identified and corrected in time. In 2018, it was noted that several of the preceding results related processes were several hours behind schedule, which restricted available time for subsequent processes. While refinements to this process have been made each year to increase the efficiency of the process, there still remain opportunities to introduce more robust validation checks, which have been identified and included in this report.

The findings in this report have been split into two sections: detailed observations and other matters. Within the detailed observations section are specific findings and recommendations related to the ATAR results process error that occurred and that would improve the current level of validation checks in place. Recommendations include improving the current level of documentation of processes and incorporating other data sources into checks to better identify anomalies.

In addition to our detailed observations, we noted matters that impact the broader processes performed by EPR and TASC, which have been reported under other matters. These matters include considering the impacts of new systems being implemented and the level of testing performed, conducting a broader review of how the senior secondary results process operates in other jurisdictions and improvements in how documentation is stored.

FINDINGS SUMMARY

The findings identified during the course of this internal audit are illustrated in the summary below. A full list of the findings identified and the recommendations made is included in the balance of this report.
Department of Education – ATAR Results Process Internal Audit Report

1. Executive Summary

FINDINGS

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<thead>
<tr>
<th>Ref #</th>
<th>Description</th>
<th>Detailed Findings</th>
<th>Process Priority</th>
<th>Issue Owner</th>
<th>Target Date</th>
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<tbody>
<tr>
<td>2.1</td>
<td><strong>Process documentation</strong></td>
<td>There are a number of processes involved in calculating student tertiary entrance scores, including validation checks which are being developed and refined each year. However, the process is not formally documented.</td>
<td>High</td>
<td>DoE Director – Education, Performance and Review</td>
<td>31 July 2019</td>
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<tr>
<td>2.2</td>
<td><strong>Validation checks</strong></td>
<td>It was noted that EPR have introduced a number of validation checks within the results calculation processes. However these checks primarily focus on the internal consistency of data and may result in some types of errors going undetected.</td>
<td>High</td>
<td>DoE Director – Education Performance and Review</td>
<td>31 July 2019</td>
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<tr>
<td>2.3</td>
<td><strong>Interpolation checks over scaling data</strong></td>
<td>For the 2018 school year, an additional validation check was introduced. This check was designed to identify if the scaling factors had been correctly transferred from the Scaling Spreadsheet to the database used in the next stage of the calculation process. It is at this stage where the error occurred in the 2018 process and the validation check that was introduced did not identify the error. The structure of the original source data and the validation check sheet were different, making the validation check more difficult to perform.</td>
<td>Medium</td>
<td>DoE Director – Education Performance and Review</td>
<td>31 March 2019</td>
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<td>2.4</td>
<td><strong>Scaling data</strong></td>
<td>A spreadsheet is used by the TASC Scaling Committee to determine the factors to be used in calculating student results for HAP-UCP units. In 2018, there was a transposition error in copying scaling factors from this spreadsheet to the interpolation database. This was in part caused by the level of manually manipulating spreadsheet filters to select the correct data for upload.</td>
<td>Low</td>
<td>DoE and TASC Director – Education Performance and Review</td>
<td>31 March 2019</td>
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### 1. Executive Summary

**FINDINGS (continued)**

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<tr>
<th>Ref #</th>
<th>Description</th>
<th>Process Priority</th>
<th>Issue Owner</th>
<th>Target Date</th>
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| Other Matters | **3.1 Introduction of new TRACS system**  
During 2019 it is planned that the existing TASC system used by TASC and EPR will be replaced by a new system called TASC Reporting Assessment and Certification System (TRACS). While the introduction of TRACS represents an opportunity to automate and streamline existing manual processes, it also introduces potential risks of delays and errors in processing while the new system is bedded down if adequate testing is not performed. | High            | TASC Executive Officer | 31 August 2019 |

|       | **3.2 Jurisdictional analysis**  
An opportunity exists for TASC and EPR to perform a benchmarking exercise against other states and territories around the country, considering their processes for managing their results processes. TASC and EPR may be able to refine their own processes based on these learnings. | High            | TASC Executive Officer | August 2019    |

|       | **3.3 Document management**  
EPR retain all documents, files and other artefacts from the results calculation process which are stored on a fileshare rather than a formal document management system. In order to maintain a record of what happened and when, in regards to the 2018 results process error, EPR had to be careful to not modify or change any properties in these files when they accessed them. | Low             | Director – Education Performance and Review | 30 June 2019   |
2. Detailed Findings
2. Detailed Findings

2.1 Process documentation

Findings

EPR staff have been refining their quality assurance and validation processes each year and adding additional checks to help identify inconsistencies within senior secondary results data. However it was noted that due to the evolving nature of the processes and procedures in place there is limited documentation to explain the validation procedures that have been developed, what they are designed to detect and how they should be performed. As a result, there are a limited number of EPR staff able to assist in this process.

The evolution in validation processes has been driven by the changes in the method of scaling senior secondary results to derive Tertiary Entrance Scores. Prior to the 2016 school year, for students completing HAP-UCP units there were fixed scaling factors in place to convert university scores to a subject score for the purposes of calculating a student's overall tertiary entrance score. From the 2016 school year onwards, scaling was introduced with these scaled scores being discussed and agreed upon by the TASC Scaling Committee each year. The introduction of scaling has resulted in a more rigorous, complex but time consuming process for EPR staff.

An example of this lack of documentation relates the Microsoft Power BI dashboard that has been used to validate data. The dashboard has been developed to allow EPR to manipulate views on the data set to identify internal inconsistencies within the data. For instance, students who may have been flagged as achieving their TCE, but have not passed each of the required standards. There are a number of ways to filter this data, however there are no documented instructions for an uneducated user on what checks need to be performed and what exceptions a user should be aware of.

Potential impact

Where there is limited guidance available on how to perform validation checks, it increases the reliance on a small number of EPR staff who were originally responsible for designing and implementing the validation checks. This can lead to key person dependencies and an inability to run the results process if those staff are unavailable.

Recommendations

It is recommended that Management undertake the following:

- Formally document all steps in the senior secondary student results calculation process. This should also include each validation check performed, its purpose and expected results.
- Using the process documentation developed, upskill other EPR staff so they are able to assist in the process in future periods.
2. Detailed Findings

2.1 Process documentation (continued)

Agreed Management Actions

The Department of Education (DoE) and the Office of Tasmanian Assessment, Standards and Certification (TASC) agree that all steps in the senior secondary results calculation process should be documented and that other staff in the Education, Performance and Review unit should be upskilled with the relevant processes. The following actions for DoE pertain:

- Document data flow processes end-to-end to HAP-UCP data, including data standards at each landmark or interface across systems
- Validation checks – (detailed under 2.2)
- Train other EPR officers in the scaling data flows
- Retrain EPR officers in the upload the resulting data into TASC systems

Responsibility

DoE
Director – Education, Performance and Review
31 July 2019
2. Detailed Findings

2.2 Validation checks

Findings and potential impact

It was noted that EPR have introduced a number of validation checks within the senior secondary results calculation processes. However these checks primarily focus on the internal consistency of data and may result in errors being undetected. In particular, the following observations were made:

- Several validation checks have been developed, such as looking at scaling curves to identify outlying data points which would indicate an error.

- Validation checks are based on checking data derived from one source, or after a specific stage in the process has been completed. In addition, while a Power BI dashboard has been developed to help analyse student data for errors, it is noted that the data used is derived from a single source. In instances where a process step has been completed incorrectly and the validation check at that stage fails to identify the error, then incorrect data may be introduced which subsequent validation checks may be unable to detect.

- Year-to-year comparisons of scaling values are reviewed by the TASC Scaling Committee. However, in subsequent data processing, there are no validation checks designed to compare the results calculated for the current year to those produced in prior years for consistency. By comparing year on year trends in data, it would increase the likelihood that anomalies would be identified and corrected in a timely manner.

Recommendations

It is recommended that Management consider the following:

- Consider the current validation checks in place and the potential to incorporate the use of data captured at various stages of the results calculation process. In particular, using data sourced from alternative sources (e.g. scaling spreadsheets) to recalculate results to act as a reasonableness check, to ensure that results calculated are in line with expectations.

- Enhance the current Power BI dashboards by importing data from different stages and systems used in the results calculation process. The capabilities within Power BI could be utilised to perform recalculations of results as required, or to identify inconsistencies between data sets.

- Incorporate historical results into validation checks performed, to identify inconsistencies. Examples where this may be relevant include:
  - **HAP-UCP subject scaling check graphs**: Comparing the shape of scaling curves to those in previous years to assist in identifying outliers, or unexplained movements.
  - **Average student marks per course**: Comparing the year on year average student mark achieved for a subject after scaling has been applied. This would assist in identifying inconsistent scaling or possible corruption of student results data.
2. Detailed Findings

2.2 Validation checks (continued)

Agreed Management Actions

DoE and TASC agree that a reasonableness check should be implemented within current validation checks as well as through the inspection of historical data for inconsistencies with the data.

Additional validation checks will be introduced by DoE at several steps of the data processing, including:

- “end-to-end” reasonable checks with reference to prior year or related data
- data sources beyond the immediate data function being implemented.

Responsibility

*DoE*

Director – Education Performance and Review
31 July 2019
2. Detailed Findings

2.3 Interpolation checks over scaling data

Findings
For the 2018 school year, EPR introduced an additional validation check. This check was designed to identify if the scaling data had been correctly transferred from the Scaling Spreadsheet to the database used in the next stage of the calculation process. It is at this stage where the error occurred in the 2018 results process. The validation check that was introduced did not identify the transposition error.

This validation check involves an Excel table generated of all HAP-UCP units and the scaling factors applicable for each score between 50% and 100%. The control requires EPR staff to check that the scaling factors are ascending (ie. the interpolation process has been performed correctly) and that the scaling factors agree back to the original scaling spreadsheet.

In considering the Excel table that is produced to perform this validation check, it was noted that it is not structured in the same format as the scaling spreadsheet. The scaling spreadsheet has courses running top to bottom and scores running left to right. The validation check Excel table has courses running left to right and scores running top to bottom. As a result, the process to check between the two documents is complex.

Potential impact
As there is a difference in structure between the two documents used to perform the validation check, the process to perform the check is more complicated and time consuming than it needs to be. In addition, it increases the likelihood that errors may not be easily identified and resolved.

Recommendations
It is recommended that Management restructure the validation check sheet so that the two axis’ are consistent with the original source scaling spreadsheet.

Agreed Management Actions
DoE and TASC agree with this recommendation. The following actions pertain:

- DoE to restructure the validation check sheet of HAP-UCP conversion table to a common standard from the Scaling Committee approved views in 2018

Responsibility
DoE
Director – Education Performance and Review
31 March 2019
2. Detailed Findings

2.4 Scaling data

Findings
To assist in determining the scaling factors for student results, a scaling spreadsheet has been developed. This spreadsheet is used by the TASC Scaling Committee to moderate and determine the factors to be used. As noted in finding 2.3, in 2018 there was a transposition error in copying scaling factors from this spreadsheet to the interpolation database.

The scaling spreadsheet contains historical data of previous scaling factors used for each course, to help the TASC Scaling Committee agree to the appropriate factors to use in the current year.

After the scaling process has been completed, various filters are applied to only display the scaling factors for the current year. In addition, several columns are hidden so they only display the relevant data required to be uploaded into the interpolation database. This is a manual process which requires knowledge of what fields are required for the uploaded data.

Potential impact
Given the manual nature of the manipulation of the scaling spreadsheet and upload process, it is prone to error, such as incorrect data being selected, or data being in a different order or format to what is required.

Recommendations
The risk of error in these manual processes would be reduced if greater automation and in-system processing is able to be performed. Where this cannot be achieved in the short term, the following is recommended.

Management update the existing scaling spreadsheet to add a dedicated upload template. This template should extract the current year scaling factors and structure them in the format and order required for upload into the interpolation database. Through this restructuring of the data, it should remove the need to manually filter, reorder and hide unnecessary data in preparation for upload.

Agreed Management Actions
The DoE and TASC agree that an automated and in-system processing should be introduced.

DoE agrees to develop a dedicated interface template for migration of data from the common standard of the Scaling Committee approved views in 2018.

Responsibility
DoE and TASC
Director – Education Performance and Review, DoE
Executive Officer, TASC
31 March 2019
3. Other Matters
3. Other Matters

3.1 Introduction of new TRACS system

Findings

TASC and EPR currently make use of a system called 4D to assist in the results process. There are several limitations in the 4D system which result in errors in some scenarios. A new system called TRACS is being introduced during 2019 which will replace 4D. The introduction of TRACS represents an opportunity to automate and streamline existing manual processes. Given the current level of scrutiny over the ATAR results calculation process there needs to be a focus on checking that TRACS calculates the correct student results and scores. It is planned that TRACS will go-live from April 2019 and will rollout in stages.

Potential impact

The introduction of any new system can introduce risk of delays or errors in data processing, until the system and supporting processes are bedded down. Given the level of public scrutiny there will be over the 2019 year results, it is important that TASC and EPR can provide reliable results while meeting their reporting timeframe.

Recommendations

It is recommended that Management undertake the following:

- As part of the testing of the new TRACS system, 2018 student data should be processed and the results compared to those generated under the existing system. Any differences should be investigated and remediated prior to the system going live.
- Given the level of likely public interest over the 2019 results process, consideration should be given to running the new system concurrently with the existing one, should resourcing allow. Any differences in results should be investigated and remediated.
- With the introduction of a new system, opportunities to remove a number of existing manual processes and replace them with automated procedures should be investigated. An example would be to change the existing spreadsheet based scaling process, so that agreed scaling factors are entered directly into TRACS.

It is noted that given 2019 will be its first year of operation, not all existing processes may be able to be automated within TRACS by the time the 2019 results process commences. As such, findings 2.1 to 2.4 relate to existing processes under the current system which still may be relevant for the 2019 year onwards.
3. Other Matters

3.1 Introduction of new TRACS system (continued)

Agreed Management Actions
The DoE and TASC agree with this recommendation to consider opportunities for automation of data processing, and that testing of any automation is undertaken to confirm reliability.

Testing of proposed automated processes will include a comparison of 2018 student data in TRACS and with those results previously generated in the existing 4D system.

Whilst it is not possible to run the 4D system concurrently past 2 April 2019, the testing outlined above will provide for quality assurance and comparability.

Responsibility

TASC overseeing, with support from DoE

Executive Officer, TASC

31 August 2019 – Opportunities for automation for 2019 are identified

Date to be confirmed dependent on the above action—Testing of any new automated processes.
3. Other Matters

3.2 Jurisdictional analysis

Findings

Nationwide, each state and territory is required to calculate and release Year 11 and 12 results, along with ATAR scores to State Tertiary Admission Centres by 18 December each year. In Tasmania the time period between students sitting exams and the release of results has resulted in time pressures for TASC and EPR staff to scale and calculate final scores within the allotted timeframe. These time pressures can increase the likelihood of errors occurring.

All other jurisdictions across the country must also calculate results within a limited time and for larger student populations. An opportunity exists to identify processes used by other states and territories which if introduced by TASC/EPR could improve and streamline processes.

It is noted that such a benchmarking exercise was not within the scope of this internal audit.

Potential impact

All states and territories are required to perform similar processes to calculate senior secondary student results. Tasmania may be able to leverage off processes used elsewhere to refine existing processes and reduce risk.

Recommendations

It is recommended that Management undertake a benchmarking exercise across other jurisdictions to understand what processes they have in place over senior secondary / ATAR results processing. From this, any better practice approaches should be investigated further with the aim of potentially implementing by TASC or EPR.

It is noted that this benchmarking exercise should focus on the end to end process, rather than just specific scaling activities.

Agreed Management Actions

TASC agrees to undertake a benchmarking exercise across other jurisdictions in regard to senior secondary results and ATAR processing.

Responsibility

TASC

Executive Officer

August 2019
3. Other Matters

3.3 Document management

Findings

As part of our discussions with EPR staff it was noted that all documents, files and other artefacts from the results calculation process are stored on a fileshare. In addition, given the issues that were encountered in the calculation of the 2018 year senior secondary results, EPR staff have been careful to maintain the file properties including last edited date so as to maintain a record of what occurred, and when. To do so, staff are unable to save any documents they opened, instead separate "working" copies of each file needed to be made. This results in a cumbersome process for EPR staff. It is also noted this folder is accessible to EPR teams, but not TASC teams. TASC do not have direct access to the documentation.

Potential impact

Where there are limited or rudimentary document management processes in place, it increases the risk that an accurate record of changes made to key process artefacts may not be maintained. In particular, where an issue occurs or errors are identified in the calculation process, having an accurate record of data and changes made to data is important in being able to trace the cause or time of when any issues occurred.

Recommendation

It is recommended that Management undertake the following:

- Investigate the ability to store key artefacts generated through the results calculation process on the Department's document management system.
- Where it is not considered practical to store all artefacts within the document management system, engage with the Department's Information Technology (IT) team in regards to the capability to run more frequent backup routines over nominated fileshare folders which hold results information. Discussions with IT may also include any retention periods required over this data.

Agreed Management Actions

DoE and TASC agree that Management should store key artefacts generated through the results calculation process on the Department’s document management system and engage with the Department’s IT Services where necessary in order to do so.

Responsibility

DoE

Director – Education Performance and Review

30 June 2019 – Development of fileshare system accessible to relevant EPR and TASC staff.
Appendix 1: Scope

The scope of the Engagement is agreed as follows:

- Consider the current processes and controls in place in regards to the importing and validating of data in relation to Tasmanian Certificate of Education (TCE) and Australian Tertiary Admission Ranking (ATAR) results. Focus will be given to the processes regarding University of Tasmania High Achiever Program (HAP) - University Connections Program (UCP) results scaling.

- Test key controls regarding the importation, manipulation and validation of HAP-UCP results, to check whether they are designed, implemented and operating effectively.

- Consider the process for transferring final results from Education Performance and Review (EPR) to the Office of Tasmanian Assessment, Standards and Certification (TASC), including any validation checks performed by TASC over the accuracy and completeness of data provided.

- Test EPR’s key validation controls over data to be provided, in particular whether they are designed, implemented and operating effectively.

The Department of Education has gained approval from TASC for consideration of their data validation checks to be included within the scope of this internal audit.

Internal control structure

Due to the inherent limitations of any internal control structure, it is possible that fraud, error or non-compliance with laws and regulations may occur and not be detected. Further, the greater internal control structure, has not been reviewed in its entirety and, therefore, no opinion or view is expressed as to the effectiveness of the greater internal control structure.

The procedures performed were not designed to detect all weaknesses in the control structure as they are not performed continuously throughout the period and the tests performed on the control structure are on a sample basis.
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