

Curriculum Council

Summary Statistics on Tertiary Entrance Examination Papers, 2001

Candidates

The number of students who sat one or more Tertiary Entrance Examinations increased slightly to 12058 in 2001 from 11986 in 2000. Slightly fewer examinations were sat (54686 in 2001 compared with 54461 in 2000), reflecting the trend for individual students to sit very slightly fewer subjects.

The following comments on specific TEE subjects and their examinations are based on statistics presented in Table 4.11.

There were substantial increases (greater than 10 percent) in the proportions of candidates who sat the TEE in Chinese: Second Language, Drama Studies, Indonesian: Second Language and Political & Legal Studies. Drama Studies (commenced in 1999) and Political & Legal Studies (commenced in 1997) are relatively new subjects that are still increasing in popularity. Another relatively new subject, Information Systems (commenced in 1997), made a smaller amount of growth.

Conspicuous decreases (more than 10 percent) were observed in Geology, German, Indonesian: Advanced and Malay: Advanced.

Full use of the marking scale

Examiners are expected to make full use of the marking scale. A restricted range of marks increases the risk of mis-ranking candidates. In 14 subjects (13 in 2000) the marks spanned 90 or more percentage points, and in a further 10 (7 in 2000) subjects the range was 80–89. The subjects with a range less than 80 were Chinese: Second Language, ESL, Geology, German, Indonesian: Advanced, Malay: Advanced and Music. With the exception of ESL, the examinations in these subjects usually have a restricted range of marks.

Level of difficulty

TEE examiners were asked to set examinations that would result in mean raw marks of 55–60 percent. Sixteen examining panels (13 in 2000) achieved the desired level of difficulty. The only examination with a mean mark below 50 percent was Physical Science. Four subjects had comparatively easy papers with mean marks above 65: Chinese: Second Language, Geology, German and Italian.

In German, it is usually claimed that the high number of background speakers gives the impression that the examination is easier than it is; however, since the mean raw TEE mark was 66.97 with background speakers excluded the 2001 paper was still too easy. The Chief Examiner judged the level of difficulty of the paper in Chinese: Second Language to be appropriate for totally second language candidates. According to the Chief Examiner eligibility for this subject remains problematic because there is a wide spectrum of language background amongst candidates. In Geology the Chief Examiner reported that a “smaller number of candidates sitting, coupled with the stronger performance across the entire paper, has resulted in a much higher overall mean mark”. Examiners of German and Italian will be asked to make their papers for 2002 more difficult.

Raw TEE marks were subjected to standardisation, which adjusted them to the same distribution in every subject. Thus, if examiners did not achieve a mean mark in the desired range (55–60), candidates who sat the examination to the best of their ability experienced no disadvantage. However, their raw examination marks may have been adjusted by a considerable amount during standardisation.

Reliability

Overall, the reliabilities of all of the examinations were high in 2001, considering that they were untrials tests. They ranged from 0.62 to 0.93 (0.73 to 0.97 in 2000). Sixteen subjects had a higher reliability in 2001 than in 2000, while fourteen had lower reliabilities. A conspicuous increase was seen in Music, and conspicuous decreases were seen in Art and ESL. These changes did not coincide with any changes in syllabus or examination format, and therefore reflect the success of the examiners in ranking candidates.

Concurrent evidence for validity

The Pearson correlation coefficients between TEE marks and school marks, after adjustment to a common scale, provide concurrent evidence of validity for the examinations. They represent the extent to which the two measures—the external assessment and the internal assessment—measure the same construct. If the TEE measures something markedly different from what teachers measure with their assessments, the correlation will be substantially lower than 1.00.

It can be seen in the table that the correlations between school-based marks and the TEE are generally high, ranging from 0.71 to 0.96 (0.62 to 0.94 in 2000). An overall judgment that the TEE assessed the same achievements as the school-based assessments seems reasonable.

Conclusions

The statistical evidence from the 2001 TEE papers indicates that the overall quality of the examinations remains at least as high as we have grown accustomed to in recent years. The high reliability statistics would not be possible without a high level of comparability in the marking process. In a few cases, the statistics can be used to point out to examiners specific areas for improvement in the future.

Strong evidence for validity comes from:

- The methodology of content control;
- The statistical evidence for concurrent validity;
- The evidence of internal consistency implied by the generally high reliability statistics;
- The overall public acceptability of the examinations.

It may be concluded from this that the 2001 TEE papers provided valid and credible assessment of the appropriate Year 12 subjects.

Notes on Table 4.11

Table 4.11 displays statistical data relating to the effectiveness of the 2001 Tertiary Entrance Examinations as assessment instruments for the purpose of university entrance. Statistics in parentheses are for the 2000 papers, and are included for comparison. The notes provided below should be read in conjunction with the table.

Since these statistics are intended to allow the reader to evaluate the TEE papers, rather than the candidates, summary statistics for papers set in other states (ie Japanese: Advanced and Modern Greek) are not stated. For these examinations some of the summary statistics are unavailable because only a limited set of marks was available to the Curriculum Council

Column 2:	The number of candidates in WA in 2001 (2000 in parentheses).
Column 3:	The mean is the average percentage score achieved by candidates on the paper and acts as a rough measure of difficulty. Examining panels are instructed by the Curriculum Council to try to set a paper with a mean in the range 55-60. When the mean is outside this range, standardisation may change students' marks considerably.
Column 4:	The range is one plus the difference between the maximum and minimum percentage scores achieved by candidates. It is a measure of the spread of scores and use of the measurement scale. Examining panels are instructed to try to use the full measurement scale of 1 to 99 as this allows greater discrimination between students.
Column 5:	The reliability indicates how internally consistent the examination is. A high reliability is needed for candidates to be ranked accurately. A perfectly reliable examination would be completely free of errors of measurement and would produce the same candidate scores each time it was set and marked. A perfectly reliable examination would have all items measuring in the same dimension and would result in a reliability of 1.0. Where papers allow students a choice of questions between sections, or throughout the entire paper, it is not appropriate to calculate the reliability. The reliability is given for the paper as a whole and for the multiple-choice section where appropriate.
Column 6:	The Pearson correlation coefficient between the standardised examination marks and the standardised moderated school assessments measures the concurrent evidence for validity of the paper. A perfectly linear relationship between candidates' standardised examination marks and standardised moderated school assessments would result in a correlation of 1.0 and would indicate that the examination measured the same achievements as were assessed in class by teachers.

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Table 4.11 Summary Statistics on Tertiary Entrance Examination Papers, 2001

Subject	No. of Candidates		Mean (%)		Range		Reliability				Concurrent Validity	
							Multiple Choice		Total Examination			
Accounting	1120	(1176)	54.4	(58.25)	92	(97)			0.89	(0.93)	0.90	(0.89)
Ancient History	285	(303)	61.11	(64.27)	92	(80)			N/A	(N/A)	0.78	(0.83)
Applicable Mathematics	4577	(4783)	64.5	(63.55)	96	(100)			0.89	(0.92)	0.90	(0.91)
Art	1077	(1085)	58.32	(53.74)	84	(98)			0.84	(0.97)	0.79	(0.83)
Biology	1815	(1965)	55.89	(53.99)	90	(77)	0.93	(0.93)	0.86	(0.82)	0.88	(0.87)
Calculus	1761	(1886)	56.79	(55.07)	97	(98)			0.93	(0.92)	0.92	(0.91)
Chemistry	3441	(3623)	56.06	(56.58)	92	(96)	0.96	(0.97)	0.89	(0.88)	0.93	(0.92)
Chinese: Advanced	77	(70)	61.81	(56.76)	82	(78)			0.93	(0.84)	0.83	(0.78)
Chinese: Second Language	22	(14)	72.05	(59.57)	57	(43)			0.69	(0.73)	0.80	(0.62)
Discrete Mathematics	7215	(6695)	52.42	(60.45)	94	(94)			0.88	(0.89)	0.88	(0.87)
Drama Studies	1015	(922)	55.94	(48.67)	95	(78)			0.91	(0.84)	0.79	(0.78)
Economics	2833	(2980)	58.16	(55.53)	93	(97)	0.72	(0.68)	0.76	(0.74)	0.88	(0.89)
English	7965	(8019)	56.70	(57.18)	100	(98)			0.73	(0.75)	0.71	(0.72)
English as a Second Language	716	(748)	59.50	(66.98)	71	(81)	0.80	(0.71)	0.62	(0.79)	0.86	(0.82)
English Literature	2704	(2641)	59.66	(60.73)	99	(98)			0.82	(0.75)	0.80	(0.78)
French	314	(335)	58.35	(58.37)	82	(85)			0.89	(0.90)	0.94	(0.94)
Geography	3949	(3949)	54.14	(53.94)	86	(92)	0.46	(0.49)	0.75	(0.74)	0.84	(0.83)
Geology	40	(68)	65.03	(55.32)	41	(63)	0.86	(0.96)	0.80	(0.87)	0.77	(0.83)
German	107	(150)	72.97	(66.31)	78	(79)			0.91	(0.87)	0.96	(0.94)
History	2968	(2856)	59.26	(59.30)	97	(93)			0.87	(0.91)	0.76	(0.77)
Human Biology	4122	(3905)	62.83	(57.50)	81	(81)	0.95	(0.95)	0.82	(0.79)	0.89	(0.88)
Indonesian: Advanced	191	(224)	57.68	(56.21)	69	(66)	0.45	(0.45)	0.92	(0.73)	0.75	(0.78)
Indonesian: Second Language	159	(112)	56.41	(59.92)	85	(85)			0.91	(0.87)	0.90	(0.91)
Information Systems	694	(679)	55.83	(51.25)	87	(84)			0.82	(0.79)	0.83	(0.84)
Italian	209	(197)	67.27	(60.53)	83	(75)			0.87	(0.88)	0.89	(0.92)
Japanese: Advanced*												
Japanese: Second Language	294	(282)	54.94	(52.88)	87	(88)			0.87	(0.91)	0.96	(0.92)
Malay: Advanced	64	(87)	60.77	(65.06)	72	(72)			0.90	(0.87)	0.82	(0.75)
Modern Greek*												
Music	340	(322)	61.11	(64.76)	76	(78)			0.83	(0.71)	0.92	(0.91)
Physical Science	294	(268)	48.88	(56.13)	84	(73)	0.93	(0.94)	0.89	(0.90)	0.90	(0.91)
Physics	3131	(3237)	57.71	(62.43)	93	(96)			0.85	(0.91)	0.91	(0.91)
Political and Legal Studies	1034	(868)	51.93	(52.79)	95	(91)			0.88	(0.87)	0.85	(0.88)
		=SUM(C9:C42)										

Note: Statistics on two other TEE subjects, Modern Greek and Japanese: Advanced, are not presented above because the examinations were written in other states and there were insufficient data from the WA candidates to derive meaningful summary statistics.

