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International Symposium on
Social Sciences and Management

ICEEPS

International Conference on
Education, Psychology and Society



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and Management

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Conference Schedule

February 3, 2015
Organizing Committee Meeting
(Committee only, not open to the public)

February 4, 2015	
Oral Session	
Time	Information
08:00-17:30	Registration
08:45-10:15	603 Society (1) / Culture (1)
	604 Education (1)
10:15-10:30	Tea Break
10:30-12:00	603 Management (1)
	604 Keynote Speech <i>Social Science:</i> Prof. Zabihollah Rezaee Teaching Business Sustainability: Its Time Has Come
12:00-13:00	Lunch Time
13:00-14:30	603 Management (2)
	604 Tutorial Course Prof. Jeffrey Trambley Presentation Skills to Impress: Making Presentations that POP
14:30-14:45	Tea Break
14:45-16:15	603 Management (3)
	604 Education (2)
16:15-16:30	Tea Break
16:30-18:30	603 Education (3) / Communication
16:30-18:00	604 Management (4) / Economics / Culture (2)

February 4, 2015	
Poster Session	
609	
15:00-16:00	Education (1)
	Psychology
	Society
	Economics
	Management

February 5, 2015	
Oral Session	
08:30-17:30	Registration
08:45-10:15	603 Politics & Laws
10:15-10:30	Tea Break
10:30-12:00	603 Education (4)
12:00-13:00	Lunch Time
13:00-14:30	603 Education (5)
14:30-14:45	Tea Break
14:45-16:15	603 Education (6) / Psychology
	604 Society (2)
16:15-16:30	Tea Break
16:30-18:00	603 Finance
	604 Education (7)

February 5, 2015	
Poster Session	
609	
08:45-10:15	Psychology
10:30-12:00	Education (2)
	Finance

ICEEPS-1801

The Equating of the Test of English Proficiency (TOEP)

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Abstract

This study aims to determine equility of 7 sets of Test of English Proficiency (TOEP). Every set of TOEP consists of 50 items Listening and 50 items Reading. The equating were using the equivalent group design without common item. This study uses TOEP data from the 2007-2010 test period in the senior high school students across Indonesia. The testees' responses were analyzed using Rasch models to estimate the item parameters. The set of item parameters every set of TOEP equated to the TOEP 1, using the mean and sigma method. In equating, the obtained results were the transformation equations to TOEP 1, then they were used to equate the level of items' difficulty of each set of TOEP. The result of the transformation of the items' difficulty level is used to create an image of the test characteristic curve, and the curves of the seven tests were then compared. The analysis showed that the seven tests are equivalent, as indicated by the graph of the 7 characteristic curves coincide with each other, both on the Listening subtest and Reading subtest of TOEP.

Keywords: Equating, Listening, Reading, Test of English Proficiency (TOEP)

1. Introduction

In the two last decades, The sciences and communication technology have been developed rapidly. This development is a challenge for the global world, to be able to answer, such as by preparing human resources who can communicate internationally. One of the necessary competence in this case is the ability to speak English. In Indonesia, English language test which is considered standardized is Test of English Proficiency (TOEP) which has been calibrated and has been shown to predict the ability of participants to the IELTS or TOEFL.

The competence in using English language is basically a person's ability to communicate, so it is often referred to communicative competence. Various models of communicative competence initiated by the linguists basically have the same concept that includes four core competencies, namely Grammatical Competence/Linguistics, Strategic Competence, Sociocultural Competence/Sociolinguistics, and text competence ([4], [1], [5], [2], [12]). The first competency model is a model proposed by Canale ([4]) which consists of the following four key competencies: grammatical competence, sociolinguistic competence, discourse competence and strategic competence. The second model is a modified first model developed

by linguists ([1], [2]) based on the results of research in the field of language evaluation. Therefore, this second model may be more appropriate for the conceptual development of the system used as the basis of evaluation in the field of language. According to Bachman & Palmer, the term communicative competence (communicative competence) paired with the term proficiency (language ability) as a construct that should be measured in the test language. The language proficiency includes two components: language knowledge and strategic competence (or also called metacognitive strategies). A user of language requires a combination of two of these competencies to be able to generate or interpret discourse, both in the tasks in the test language and the use of real language.

Similarly, the Test of English Proficiency which measures the communicative abilities. The development of the test items of TOEP need to refer to the language skills taxonomy according Munby ([1]). The proficiency of language in particular micro skills are inherent in listening skills, speaking, reading and writing. In TOEP, there are four competencies are measured, namely listening, reading, speaking, and writing. Listening and Reading measured by a written test in the form of multiple choice, while speaking and writing in the form of an oral test and assessment of testees' products.

Starting from 2007-2010, TOEP developer that is TEFLIN in cooperation with the Directorate General of Kemendibud PSMA has developed a device 7 TOEP for Listening and Reading. The seven TOEPs were developed using the same goals, the same amount of items, and the same blue print, but with different items. In the process of development, it has been assumed that the seven devices are equivalent test, but this assumption needs to be proven empirically. Related to case the above, this study aims to equate seven TOEP devices that have been developed and used in Indonesia.

The linking scores between tests is intended to produce a score that can be interchangeable. A measure can be interchanged with one another score if the score is obtained from the same construct the tests have the same length. If the inter-device measuring the same construct and connect in the same way across different subpopulations, then connect the case of scores between this package called concordance ([10]).

In the case of linking test scores on the TOEPs, it was conducted heed the advice of Freuer ([6]) regarding 5 factors that have been a factor considered in the preparation of test items and test management are:

1. The common content, degree of difficulty and format items.
2. measurement error can be compared associated with the scores,
3. The conditions of test administration,
4. Usability of tests and its consequences,
5. The accuracy and stability of equating, including subgroups and participants stability over his tests.

The linking scores between the tests using an equivalent group design. In the equivalent group design, two tests to be equated given to two equivalent groups (not identical) randomly selected from the same population, the two groups considered to have the same ability level. The advantages of this design is more practical and eliminate the effects of exercise and fatigue. The weakness of this design is that there is a bias resulting from the process of equalization, because the groups are not necessarily the same distribution abilities. To reduce bias arising related to the sample, generally a large sample size is needed in this design.

There are various methods that can be applied linking the two test scores or more. Judging from the calibration technique, the method of connecting test scores are classified into two methods, namely a separate calibration and calibration methods simultaneously. In a separated calibration method, the two tests are calibrated separately, while in the second simultaneous calibration method calibrated test simultaneously or together. In the analysis in this study, a separated calibration method is used by the model analysis the mean and sigma method.

In the mean and sigma method, to determine equivalency constants α and β involving the mean and standard deviation of the index of items' difficulty parameters can be described as follows ([7]). Suppose first test format synchronized with the test second format, under Rasch models. Based on the equating model, relationship difficulties index parameters of items associated linearly,

$$b_2 = \alpha b_1 + \beta \quad (1)$$

then

$$\bar{b}_2 = \alpha \bar{b}_1 + \beta \quad (2)$$

and

$$S_2 = \alpha S_1 \quad (3)$$

or

$$\alpha = \frac{S_2}{S_1} \quad (4)$$

and

$$\beta = \bar{b}_2 - \alpha \bar{b}_1 \quad (5)$$

where

\bar{b}_1 and \bar{b}_2 : average of difficulty index of test 1 and test 2,

S_1 and S_2 : deviation standard of difficulty index of test 1 and test 2

α and β are equating constants.

The b parameter are difficulty index of item from equations used in the Rasch model ([7], [8], [9]) as follows:

$$P_i(\theta) = \frac{e^{(\theta-b_i)}}{1+e^{(\theta-b_i)}} \quad , i : 1,2,3, \dots, n \quad (6)$$

where:

$P_i(\theta)$: the testee probability at θ to answer i item corectly

θ : testee's ability

b_i : item difficulty index for item-i

e : natural number (2,718)

n : the number item in test

After equated, item difficulty and the ability of the test participants are on the same scale.

2. Method

This study is a quantitative approach to equate 7 TOEP that are TOEP 1, 2A, 2B, 3A, 3B, 4A and 4B. Using separated calibration method using Rasch models, the parameters of the seven TOEP items estimated using Quest computer program based on the response of testees. The items' parameters of TOEP 2A, 2B, 3A, 4A and 4B equated to the TOEP 1 using the mean and sigma.

The results of the analysis in this study in the form of item difficulty that has been equated to TOEP 1. Level of difficulty results are then used to create a test characteristic curve (TCC) based on item response theory for each TOEP. Results of TCC for each TOEP compared to others. For example packet-m said to be equivalent to the package 1, indicated by the closeness of the TCC-m package with TCC of the package 1. The closer the two curves, then both devices are said to be equivalent. This happens because the tests used gives the total probability of answering correctly is almost the same at every scale ability of students.

3. Result

The results of the analysis in this study is separated into two, according to the subtest that analyzed the listening and reading. More results from the estimation of the parameters before and after equating, and plot test characteristic curves are presented as follows.

3.1 Listening

Using the testees' responses of TOEP, the parameters for each item of Listening TOEP estimated separately. Furthermore TOEP 2A, 2B, 3A, 3B, 4A, 4B equated to the TOEP 1. The

results for 50 items before equated presented in Figure 1A. Figure 1A shows that the items of various TOEP obtained relatively the same. Only a few items of the 2A and 4B are slightly higher and a few items of 2B slightly lower. After equating, the result becomes closer to the range (-2, +2) are presented in Figure 1B.

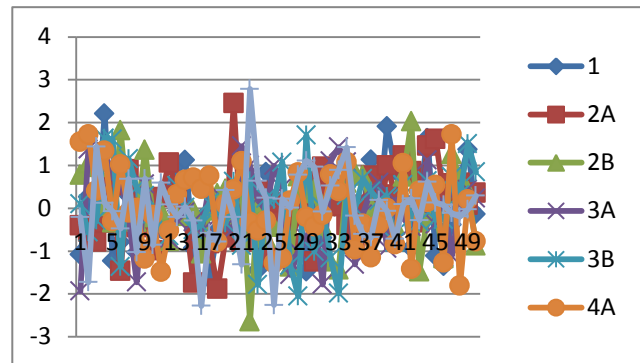
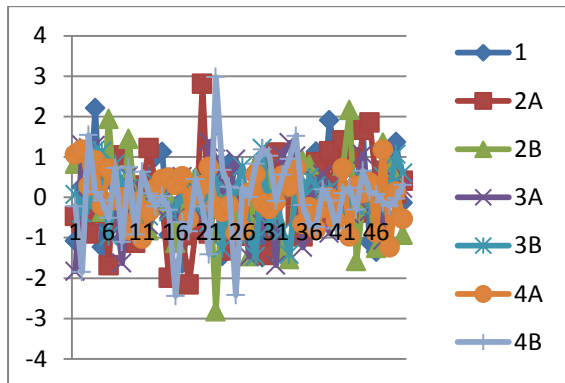


Figure 1A. The difficulty parameters of Items of TOEP (Listening) Before Equated

Figure 1B. The difficulty parameters of Items of TOEP (Listening) After Equated

By using the mean and sigma, the equations for equating of TOEPs (Listening) are obtained. The equations are presented in Table 1. These results show that the parameters of the 6 TOEP relatively close to the TOEP 1. More results are presented in Table 1.

TOEP	Equation equalization results to score TOEP1 (Listening)
1	-
2A	$b_1 = 0.87b_1$
2B	$b_1 = 0.94b_1$
3A	$b_1 = 1.06b_1$
3B	$b_1 = 1.41b_1$
4A	$b_1 = 1.46b_1$
4B	$b_1 = 0.93b_1$

The parameter difficulty of item as results from equating are then used to draw the test characteristic curve. From the results of the various TOEPs, the results of the test characteristic curve when it has not been equated is varied to scale the ability of less than -1 and more than +1. However, after equating, the test characteristic curves obtained coincides for seven listening TOEPs. More results are presented in Figure 2A for TOEPs' listening that have not equated and Figure 2B for TOEPs' listening that have been already equated.

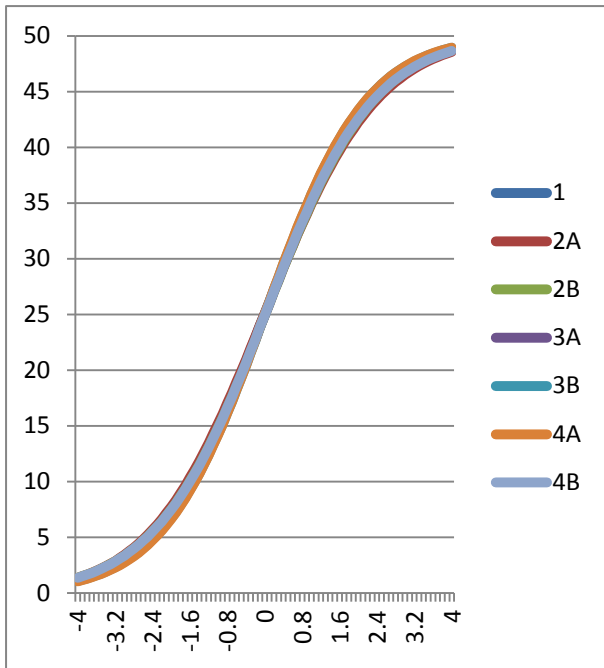


Figure 2A. The Characteristics Test Curve of 7 TOEPs' Listening Before Equated

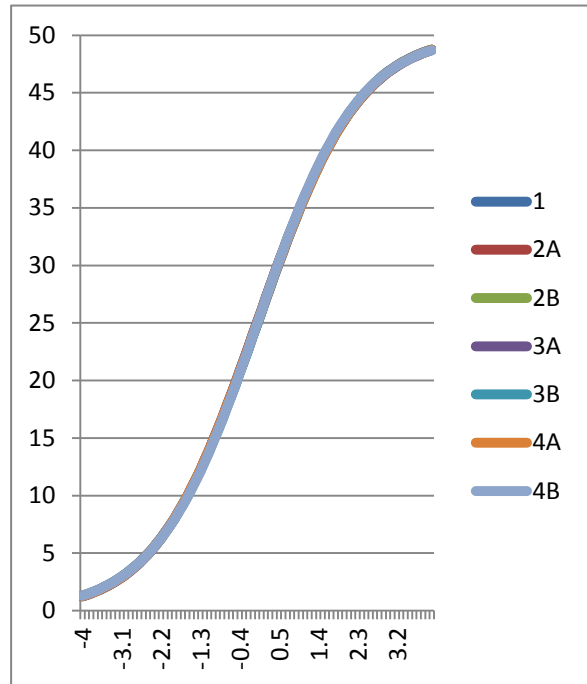


Figure 2B. The Characteristics Test Curve of 7 TOEPs' Listening After Equated

Furthermore, using the parameters of items, the values of the test information functions were estimated. These results are presented in Figure 3A and 3B. The results in Figure 3A shows that the value of the test information functions are varied. However, after equating, the values of the test information function which are almost close to the value of 26. Based on the characteristic curve and the value of the information functions, the equivalency of seven TOEPs are found.

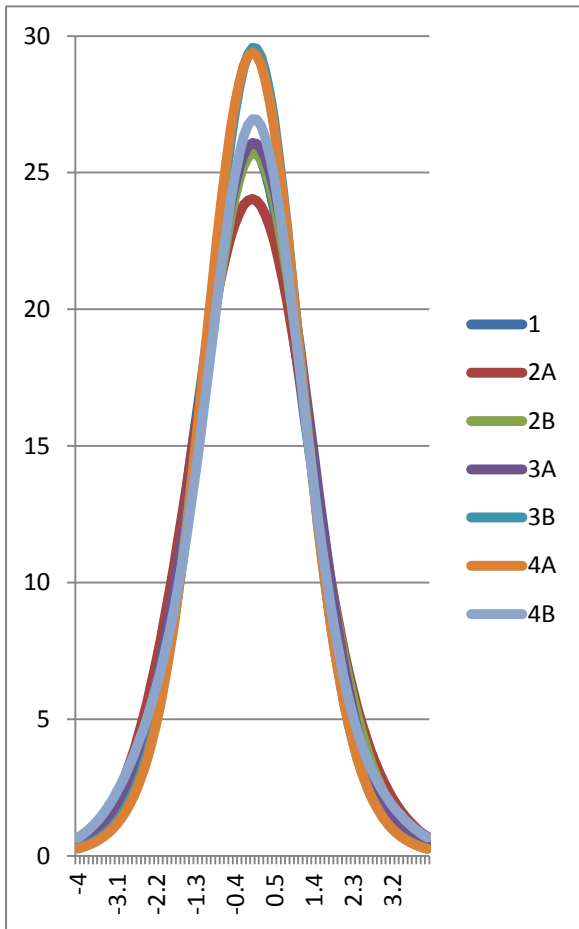


Figure 3A. The Values of Test Information Functions of TOEPs' Listening Before Equated

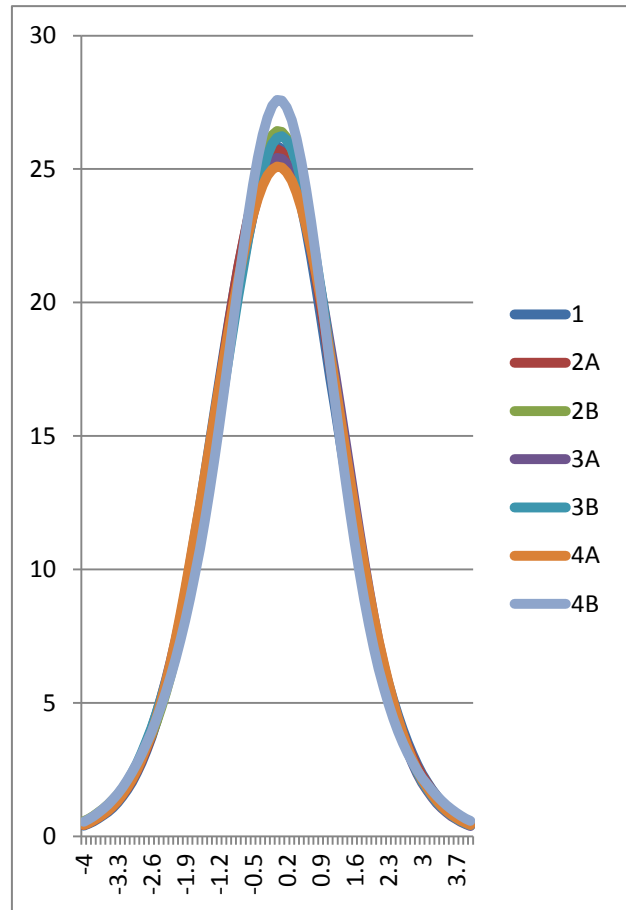


Figure 3B. The Values of Test Information Functions of TOEPs' Listening After Equated

3.2 Reading

Using the testees' responses of TOEP, the parameters for each item of Reading TOEP estimated separately. Furthermore TOEP 2A, 2B, 3A, 3B, 4A, 4B equated to the TOEP 1. The results for 50 items before equated presented in Figure 4A. Figure 4A shows that the items of various TOEP obtained relatively the same. Only a few items of the 1A and 2A are slightly higher and a few grains of 2A slightly lower. After equating, the result becomes closer to the range (-2, + 2) are presented in Figure 4B.

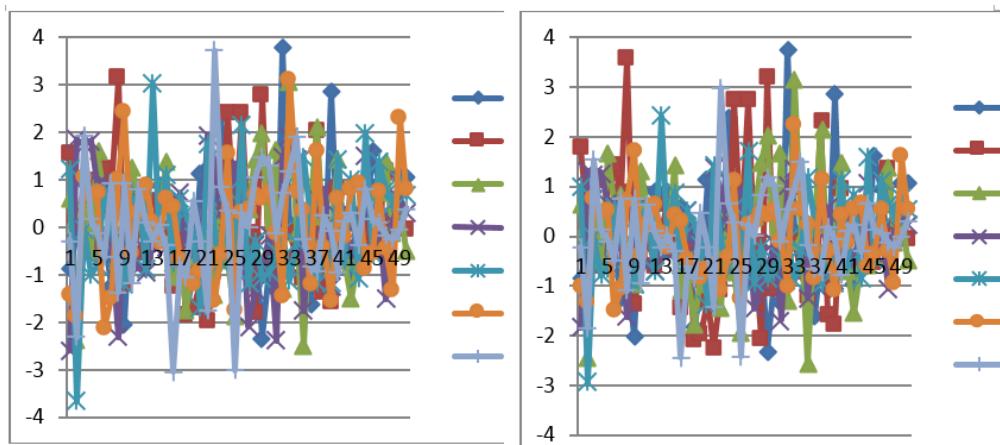


Figure 4A. The difficulty parameters of Items of TOEP (Reading) Before Equated. Figure 4B. The difficulty parameters of Items of TOEP (Reading) After Equated.

By using the mean and sigma, the equations for equating of TOEP in Reading subtests are obtained. The equations are presented in Table 2. These results show that the parameters of the 6 TOEP relatively close to the TOEP 1 (Reading). More results are presented in Table 2.

Table 2. Equation equalization results TOEP Reading scores to scores TOEP1 (Reading)

TOEP	Equation equalization results to score TOEP1 (Reading)
1	-
2A	$b_1 = 0.87b_1$
2B	$b_1 = 0.98b_1$
3A	$b_1 = 1.42b_1$
3B	$b_1 = 1.42b_1$
4A	$b_1 = 1.95b_1$
4B	$b_1 = 1.25b_1$

The parameter difficulty of item as results from equating are then used to draw the test characteristic curve. From the results of the various TOEPs, the results of the test characteristic curve when it has not been equated is varied to scale the ability of less than -1 and more than +1. However, after equating, the test characteristic curves obtained coincides for seven reading TOEPs. More results are presented in Figure 5A for TOEPs' reading that have not equated and Figure 5B for TOEPs, reading that have been already equated.

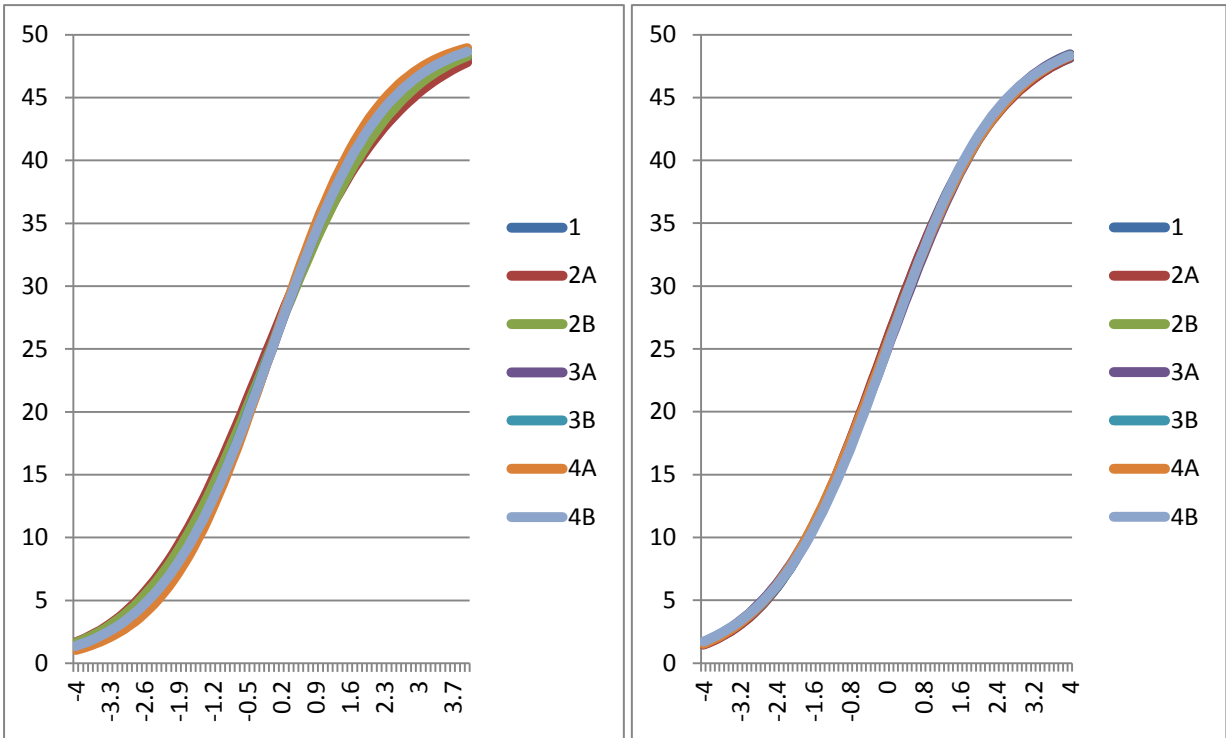


Figure 5A. The Characteristics Test Curve of 7 TOEPs' Reading Before Equated

Figure 5B. The Characteristics Test Curve of 7 TOEPs' Reading After Equated

Furthermore, using the parameters of items, the values of the test information functions were estimated. These results are presented in Figure 6A and 6B. The results in Figure 6A shows that the value of the test information functions are varied. However, after equating, the values of the test information function which are almost close to the value of 25. Based on the characteristic curve and the values of the information functions, the equivalency of seven TOEPs are found.

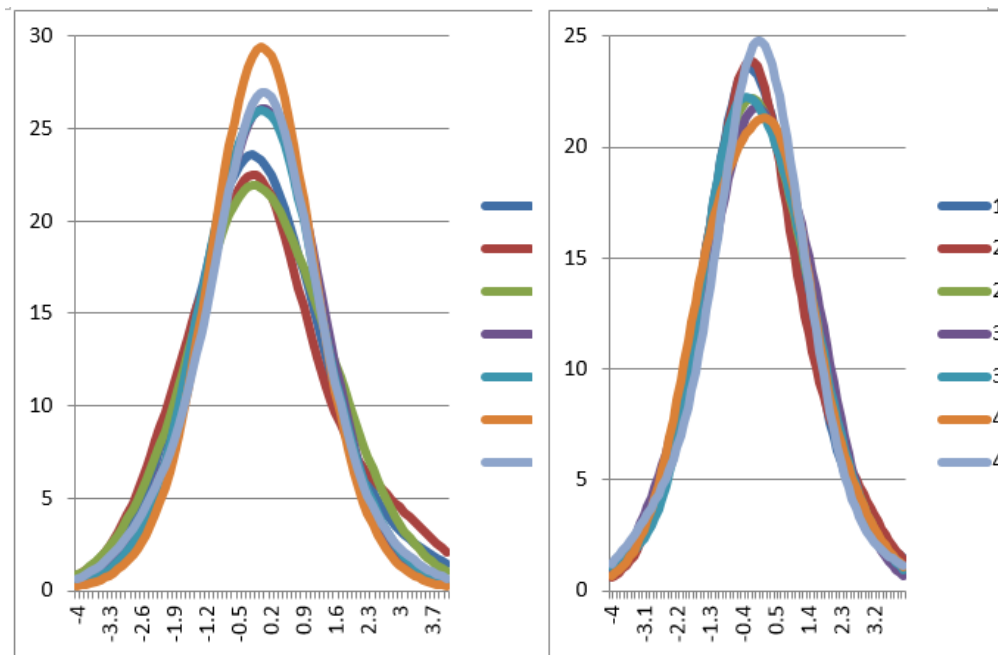


Figure 6A. The Values of Test Information Functions of TOEPs' Reading Before Equated
 Figure 6B. The Values of Test Information Functions of TOEPs' Reading After Equated

4. Conclusion and Discussion

On equating, the six TOEP are equated to TOEP 1, which is then used to equate the item difficulty of each TOEP. The result of the transformation of the difficulty level is used to create the test characteristic curves, and the characteristic curves of the seven tests were compared. The analysis showed that the seven tests are tests are equivalent, as indicated by the graph of seventh characteristic curves coincide with each other tests, both on the Listening and Reading of TOEP.

All TOEP (TOEP1, 2A, 2B, 3A, 3B, 4A and 4B) have been developed using standard test development procedures. The seven tests were developed using the same blue print. The assumption when the development of tests were also affecting the results of this analysis. Since the formulation of the test objectives, the developer has been intended that the tests are developed is equivalent tests, both the Listening and Reading. The results of the analysis prove that the seven tests are the equivalent tests.

This equating needs further evidenced by simulation studies. Using a data set that is the ability of the testee has a particular distribution, and basic on the parameter estimation results can be generated item response data. The data then are analyzed to estimate the ability of testees. The results of the analysis that are the testees' ability then compared with the initial ability are regarded as the true abilities. The accuracy of estimation can be seen either using correlation and mean square of error (MSE).

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Certificate of Attendance

**2015 International Conference on Education, Psychology and Society
February 03-05, 2015 Tokyo, Japan**

**Heri Retnawati
Yogyakarta State University**

has attended the conference and presented a paper entitled

"The Equating of the Test of English Proficiency (TOEP)"

Chief Executive Committee

