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Development, Item Analysis and Standardization of Teachers Cognitive Ability Test

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ABSTRACT

The present research study was conducted for the development, item analysis and standardization of Teachers Cognitive Ability Test. Random sampling procedure was followed to select 383 subjects from different cities. Subjects consisted of male as well as female in-service teachers. The objective of the research was achieved in the form of a reliable and valid test intended to provide an insight into those scientific methodologies that can help us measure and reorder human intelligence to enhance cognitive factors among teachers by filling the gaps, to produce successful and efficient teachers. The validity was estimated through linear regression method. The reliability was calculated via Test-Retest Method. The main objective of the study was to develop test items through Bloom's taxonomy, Leslie Wilson theory, determining the Difficulty, Discrimination Index & Reliability. The test would help in the identification, measurement and analysis of core cognitive ability factors that determine success in teaching.

Keywords: *Development and Standardization, Cognitive Ability, Bloom's taxonomy, Leslie Wilson theory, Reliability, Validity, Discrimination Index*

Teachers need effective ways to focus on their core task of improving teaching and learning. Educational improvement must be practical and collaborative. Even if schools and students differ, when teachers work together, student learning improves. The traditional professional development practices were largely based on transferring knowledge from an expert to an audience. But, these days overall Career advancement for teachers is one of the central concerns of reformers. Tracing and retaining the best qualified teachers will require the development of systems that properly reward and empower classroom teachers. Mertens and Yarger examine the issues associated with career ladder opportunities and question a selected set of assumptions that undergird professional enhancement schemes. The authors conclude with a discussion of how teacher empowerment and involvement are essential ingredients to strengthening teaching as a profession.Good teachers form the foundation of good schools, and improving teachers' skills and knowledge is one of the most important investments of time and money that local, state, and national leaders make in education. Researches reveal that students of teachers who participated in this kind of curriculum-focused professional development did well on assessments.

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Unfortunately, most teachers received less effective forms of training. Studies suggest that the more time teachers spend on professional development, the more significantly they change their practices and that participating in professional learning communities optimizes the time spent on professional development. A Piagetian approach to cognitive development assumes that cognitive development is independent from language development. Information enters the mind to stimulate cognitive development through perception of sound, visual information, speech, and touch. Cognitive organization helps to store and remember concepts. Learners are like scientists, trying to explore and figure out how the world works based on what they see, do, and hear. Teaching is an art, which must be learnt before launching ourselves into the dynamism of School life. It is the combination of structured planning and choices. The outcome of a successful career in teaching should include personal fulfillment, work/life balance, goal achievement and financial assurance. Most of the time, we opt for teaching career based on our professional qualification & academic performances, only to find out in later years that we were meant to do something else. This can drastically enhance the learning process of individuals. Thus, evaluation in its current form generally contributes little either to teacher learning or to accurate, timely information for personnel decisions. In the context of the current interest in measuring teacher effectiveness, it is important to distinguish between teacher quality and teaching quality. Teacher quality is a bundle of personal traits, skills, and understanding that an individual brings to teaching, including dispositions to behave in certain ways. Researches on teacher effectiveness, based on teacher ratings and student achievement gains, have found that qualitative teaching is essential for composed learning leading to serenity in personal and professional life.

REVIEW OF LITERATURE

Amelioration in the goals for learning, coupled with shifts in curriculum emphasis and a deeper understanding of teacher learning and student thinking, have led to new findings about the impact of teacher professional development and how best to sharpen teachers' skills and knowledge. To be effective, professional development must provide teachers with a way to directly apply what they learn to their teaching. Research shows that professional development leads to better instruction and improved student learning when it connects to the curriculum materials that teachers use, the district and state academic standards that guide their work, and the assessment and accountability measures that evaluate their success. Professional development should improve teachers' knowledge of the subject matter that they are teaching, and it should enhance their understanding of student thinking in that subject matter. Teacher quality is the most important school factor for improving student cognitive ability. Researchers have found that variation in student achievement is explained more by variation in teacher quality than variation in any other school characteristics (Rivkin, Hanushek, &Kain 2005; Rockoff 2004). Research indicates that high-quality teachers, as measured by their ability to raise student math and reading test scores, improve longer-run outcomes such as their students' educational attainment and employment income (Chetty, Friedman, Rockoff 2014). Nonetheless, scholars are generally unable to identify high quality teachers based upon observable

characteristics absent measures of student achievement. For instance, years of teaching experience is generally uncorrelated with teacher quality after the first three to five years of teaching (Boyd et al. 2007; Buddin & Zamarro 2009; Hanushek & Rivkin 2006; Clotfelter, Ladd, &Vigdor 2006; Goldhaber 2007; Kane, Rockoff, &Staiger 2008). Teacher licensure (e.g., whether a teacher has a Master's degree or completed a traditional certification program) is likewise not strongly correlated with a teacher's ability to raise student scores on achievement tests (Hanushek & Rivkin 2006; Podgursky 2005; Hanushek 1997). Although there is some evidence that having more content knowledge, as measured by the number of courses taken in that content area, is associated with higher teacher quality, this relationship largely holds for secondary school teachers, particularly in math or science (Clotfelter, Ladd, & Vigdor 2006; 6 Goldhaber& Brewer 2000; Monk & King 1994). There is also a lack of evidence that pedagogical knowledge for a specific content area is linked with student achievement (Hill, Rowan, & Ball 2005). Although some research has demonstrated that achievement is higher for students with teachers that have higher cognitive ability, as measured by their performance on the Praxis or other standardized licensure tests (Goldhaber 2007; Clotfelter, Ladd, &Vigdor 2006), other work finds no relationship between teacher cognitive ability and student achievement (Buddin&Zamarro 2009). Finally, Duckworth, Quinn, and Selgiman (2009) provide suggestive evidence that some teacher non-cognitive abilities (e.g., grit and life satisfaction) are positively correlated with student gains in cognitive ability. However, their analysis is based upon a convenience sample of an atypical group of teachers — first- and second-year Teach for America teachers. In summary, research suggests that teacher quality matters for student wellbeing, but it is difficult to predict teacher quality solely based on teacher inputs and observable characteristics. This has led to some proposals to relax the selection of teachers based upon inputs (e.g., credentials) and to evaluating teachers based upon their outputs or actual performance (e.g., student achievement) (Podgursky 2005; Goldhaber 2008; Kane, Rockoff, &Staiger 2008; Hanushek 2011). Presumably, certain pedagogical practices could shape student perception and mindset, ultimately affecting student behavior (Dweck 2006). Certain pedagogical practices may also lead to unique classroom environments or climates, which can, for example, alter student motivations to work towards a particular goal and induce students to 10 exert the necessary self-regulation towards that end (Ames 1992). Organizational features such as school or class size may also be important for cognitive skill development (Osterman 2000). Smaller class sizes may enable teachers to better motivate and engage their students. It may be easier for teachers to manage smaller classes, enabling them to more firmly establish salient values and norms that affect the cognitive skill development of their students. Indeed, data from National Education Longitudinal Study of 1988 indicate that middle-school students in smaller classes tend to be more motivated and engaged in learning (Dee & West 2011). Overall, research on cognitive skills is relatively nascent and has merely established the importance of cognitive skills for student outcomes. Sociologists have long observed that all schools have values and social norms that reinforce those values (Bryk& Driscoll 1988; Coleman & Hoffer 1987). In turn, these values and norms delineate behaviors and attitudes that are appropriate or inappropriate (Bryk et al. 1993). Students may develop particular dispositions and personality

traits as they are socialized according to these values and norms. Psychologists have long proposed that learning is social (Bandura 1977). Some have more specifically argued that individuals learn group norms by observing the behaviors of other group members, called social referents, in specific situations. A social referent helps individuals discern what types of behaviors are acceptable or unacceptable by allowing them to observe what behaviors are rewarded or sanctioned within the group (Sherif&Sherif 1964). Social referents in schools may consist of a student's peer group or teachers (Paluck& Shepherd 2012). Teachers 11 are particularly well-situated to act as role models, instilling a set of traits derived from a certain value system into their students. It is in this way that individual teachers can possibly influence the cognitive as well as non-cognitive skills of their students (Berkowitz & Bier 2004; Lumpkin 2008). The fostering of these skills is hypothesized to explain the higher levels of educational attainment among Catholic school students, even those from disadvantaged backgrounds (Altonji et al; 2005; Coleman & Hoffer 1987; Evans & Schwab 1995; Grogger& Neal 2000; Neal 1997; Sander &Krautman 1995; Sander 2001). The results, especially those concerning non-test score outcomes, are consistent with the research on cognitive skills and their role in health, crime, and attainment outcomes (Almlund, et al. 2011; Heckman et al. 2006; Heckman & Rubinstein 2001).

METHODOLOGY

The test consists of 80 Objective Test questions, and time bound for 20 minutes that is to be taken by the Teacher. Random sampling procedure was followed to select 383 subjects from different cities. Subjects consisted of males as well as females as illustrated in Fig.1

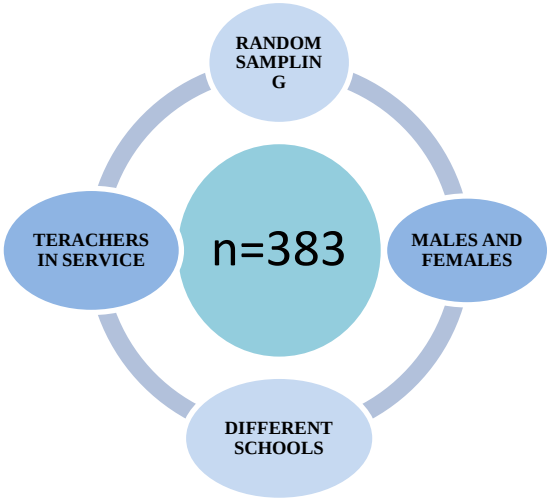

Fig.2Sampling procedure

Test results would include current cognitive capacity measure, dynamic IQ, Focus Factor, Decision Making Ability, CQ, Skill Estimation Level, Natural Learning Style, Cognitive Gaps Measurement, Gifted Ability, and Suitable Career Path.

PROCEDURE AND ADMINISTRATION

The test consists of 80 items. Rapport building was followed by giving the in-length instructions to the subjects. The specific time in which teachers were required to complete the

test was allotted and a stop watch was used for the purpose. The required material, i.e. Photocopies of test items, paper, pencil etc. was provided. Test administration procedure was similar for all the participants. Test were marked using standard procedure in which score +1 was given for each item passed. Thus total 80 marks were assigned for each test. Standardization implies uniformity of procedures in administrating and scoring the test. If the scores obtained by different persons are to be comparable, testing conditions must obviously be the same for all. The formulation of directions is a major part of the standardization of a new test. Such standardization extends to the exact materials employed, time limits, oral instructions, preliminary demonstrations, way of handling queries from test takers and every other detail of the testing situation. Another important step in the standardization of a test is the establishment of norms. As its name implies, a norm is the normal or average performance. In the process of standardization a test, it is administrated to a large, representative sample of the type of persons for whom it is designed. This group known as the standardization sample serves to establish the norms, corresponding to the performance of typical or average persons. To estimate and ensure validity, linear regression method was followed. The reliability was estimated by calculating the reliability correlation coefficient. The test-retest method was used to estimate the reliability of the test.

DATA ANALYSIS

After collecting the data, it was arranged in tabular form and following mention statistical techniques used for items

Table 1: Item Analysis Methods

1	Item analysis through Leslie Wilson
	LOTS - Lower Order Thinking Skill
	MOTS - Middle Order Thinking Skill
	HOTS - High Order Thinking Skill
2	Item analysis through Bloom's Taxonomy
3	Item difficulty level
4	Index of discrimination
5	Split half method
6	Analysis of Validity by Linear Regression

To find the item reflect the knowledge, comprehension, application, analysis, synthesis & evaluation.

To find the difficulty level and discrimination index the test score divided into three groups highest 27%, middle 46%, lowest 27% percentage.

The difficulty level was calculated with the help of formula

$$P = \frac{N_p}{N}$$

Where: NP indicates the number of test of test takers in the total group who pass the items, and N indicates the total number of test takers in the group.
The formula of the item – discrimination Index is:

$$D = \frac{U_p - L_p}{U}$$

Where: Up and LP indicates the numbers of test takers in the upper and lower groups who pass the items, and U is the total numbers of the test takers in upper group.
The discrimination index was determined by the difference between the percentages of the students doing the item right in the high achieves and low achieves group discrimination index.

Presentation and Analysis of Data
Summary presentation in tabular form: - ITEM ANALYSIS.

Table 2: Summary of Leslie Owen Wilson

	Type of Questions Age 7-16 Years Acc To Leslie Owen Wilson				
S.no	**Factual**	**Convergent**	**Divergent**	**Evaluative**	**Combination**
1	1				
2		1			
3				1	
4	1				
5				1	
6		1			
7	1				
8				1	
9				1	
10	1				
11		1			
12		1			
13				1	
14		1			
15	1				
16		1			
17		1			
18				1	
19		1			
20	1				
21				1	
22			1		
23	1				
24		1			

25		1			
26		1			
27				1	
28					1
29		1			
30				1	
31			1		
32		1			
33		1			
34				1	
35					1
36		1			
37		1			
38		1			
39	1				
40	1				
41		1			
42	1				
43			1		
44	1				
45		1			
46				1	
47				1	
48				1	
49				1	
50				1	
51				1	
52					1
53		1			
54		1			
55					1
56		1			
57	1				
58	1				
59	1				
60				1	
61				1	
62	1				
63					1
64					1
65		1			
66	1				
67	1				
68				1	

69		1			
70	1				
71		1			
72		1			
73		1			
74		1			
75	1				
76			1		
77			1		
78			1		
79			1		
80	1				
Total	20	28	7	19	6

Table 3: Summary of Bloom's Taxonomy

	Item	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**TOTAL**
Level of Learning Outcomes	1	2	3	4	5	6	7	8	9	10	
Knowledge											
Recall			1		1		1			1	4
Identify	1	1		1		1	1		1		5
Comprehension											
Interpret		1	1	1	1	1		1	1		6
Classify										1	1
Comparing	1			1	1		1		1		4
Application											
Solve			1		1				1		2
Relate	1	1	1	1		1	1	1		1	8
Analysis											
Analyse	1	1		1		1	1	1	1	1	7
Discriminate					1						1
Synthesis											
Devise		1	1		1	1		1	1	1	6
Evaluation											
Justify	1	1	1	1	1	1	1	1	1	1	9
TOTAL	**5**	**6**	**7**	**6**	**7**	**6**	**6**	**5**	**7**	**6**	

	Item	Item	Item	Item	Item	Item	Item	Item	Item	Item	TOTAL
Level of Learning Outcomes	11	12	13	14	15	16	17	18	19	20	
Knowledge											
Recall	1			1	1			1		1	5
Identify		1	1		1	1	1		1		6
Comprehension											
Interpret	1	1	1			1	1	1	1		7
Classify				1							1
Comparing		1			1		1	1	1	1	6
Application											
Solve	1						1	1		1	4
Relate		1	1	1	1	1			1		6
Analysis											
Analyse	1		1			1	1			1	5
Discriminate		1		1	1			1	1		5
Synthesis											
Devise	1	1	1	1		1	1	1	1	1	9
Evaluation											
Justify	1	1	1	1	1	1	1	1	1	1	10
TOTAL	**6**	**7**	**6**	**6**	**6**	**6**	**7**	**7**	**7**	**6**	

	Item	Item	Item	Item	Item	Item	Item	Item	Item	Item	TOTAL
Level of Learning Outcomes	21	22	23	24	25	26	27	28	29	30	
Knowledge											
Recall			1		1	1					3
Identify	1	1		1	1	1	1	1	1		8
Comprehension											
Interpret	1	1		1			1	1	1	1	7
Classify					1	1					2
Comparing		1	1		1	1					4
Application											

Solve		1	1								2
Relate	1			1					1	1	4
Analysis											
Analyse	1	1	1	1			1	1	1	1	8
Discriminate					1	1	1	1	1		5
Synthesis											
Devise	1	1	1	1	1	1	1	1	1	1	10
Evaluation											
Justify	1	1	1	1	1	1	1	1	1	1	10
TOTAL	**6**	**7**	**6**	**6**	**7**	**7**	**6**	**6**	**7**	**5**	

	Item	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**TOTAL**
Level of Learning Outcomes	31	32	33	34	35	36	37	38	39	40	
Knowledge											
Recall						1	1				2
Identify	1	1	1	1	1	1	1	1	1	1	10
Comprehension											
Interpret	1		1	1	1			1	1		6
Classify	1				1	1	1				4
Comparing	1	1	1		1	1	1		1	1	8
Application											
Solve			1								1
Relate	1	1			1			1	1		5
Analysis											
Analyse	1		1	1	1			1		1	6
Discriminate				1		1	1		1	1	5
Synthesis											
Devise	1	1	1	1	1	1	1	1	1	1	10
Evaluation											
Justify	1	1	1	1	1	1	1	1	1	1	10
TOTAL	**8**	**5**	**7**	**6**	**8**	**7**	**7**	**6**	**7**	**6**	

	Item	Item	Item	Item	Item	Item	Item	Item	Item	Item	TOTAL
Level of Learning Outcomes	41	42	43	44	45	46	47	48	49	50	
Knowledge											
Recall				1	1			1		1	4
Identify	1	1	1		1	1	1	1	1		8
Comprehension											
Interpret	1		1			1			1	1	5
Classify				1	1						2
Comparing		1	1		1		1	1		1	6
Application											
Solve			1					1		1	3
Relate	1	1		1		1	1		1		6
Analysis											
Analyse	1	1	1	1		1			1		6
Discriminate					1			1		1	3
Synthesis											
Devise	1		1		1	1	1	1	1	1	8
Evaluation											
Justify	1	1	1	1	1	1	1	1	1	1	10
TOTAL	**6**	**5**	**7**	**5**	**7**	**6**	**5**	**7**	**6**	**7**	

	Item	Item	Item	Item	Item	Item	Item	Item	Item	Item	TOTAL
Level of Learning Outcomes	51	52	53	54	55	56	57	58	59	60	
Knowledge											
Recall			1	1		1	1			1	5
Identify		1			1	1	1	1	1	1	7
Comprehension											
Interpret	1	1	1	1	1				1	1	7
Classify		1				1					2
Comparing		1			1	1	1	1	1	1	7
Application											

Solve			1	1						1	3
Relate	1	1			1		1	1	1		6
Analysis											
Analyse	1	1	1	1	1		1	1		1	8
Discriminate					1	1		1	1		4
Synthesis											
Devise	1	1	1	1	1	1		1	1	1	9
Evaluation											
Justify	1	1	1	1	1	1	1	1	1	1	10
TOTAL	**5**	**8**	**6**	**6**	**8**	**7**	**6**	**7**	**7**	**8**	

	Item	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**Item**	**TOTAL**
Level of Learning Outcomes	61	62	63	64	65	66	67	68	69	70	
Knowledge											
Recall	1	1	1	1		1					5
Identify	1				1	1	1	1	1	1	7
Comprehension											
Interpret	1				1		1	1	1		5
Classify		1									1
Comparing	1		1	1		1	1			1	6
Application											
Solve	1								1		2
Relate		1	1	1	1	1	1	1		1	8
Analysis											
Analyse	1		1	1	1		1	1	1		7
Discriminate		1				1				1	3
Synthesis											
Devise	1	1	1	1	1			1	1	1	8
Evaluation											
Justify	1	1	1	1	1	1	1	1	1	1	10
TOTAL	**8**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**5**	

	Item	Item	Item	Item	Item	Item	Item	Item	Item	Item	TOTAL
Level of Learning Outcomes	71	72	73	74	75	76	77	78	79	80	
Knowledge											
Recall	1	1	1	1	1	1	1	1	1	1	10
Identify	1	1	1	1							4
Comprehension											
Interpret					1	1	1	1	1	1	6
Classify	1	1	1	1							4
Comparing	1	1	1	1	1	1	1	1	1	1	10
Application											
Solve					1	1	1	1	1	1	6
Relate											0
Analysis											
Analyse					1	1	1	1	1	1	6
Discriminate	1	1	1	1	1	1	1	1	1	1	10
Synthesis											
Devise	1	1	1	1	1	1	1	1	1	1	10
Evaluation											
Justify	1	1	1	1	1	1	1	1	1	1	10
TOTAL	**7**	**7**	**7**	**7**	**8**	**8**	**8**	**8**	**8**	**8**	

Table 4: Summary of item analysis

Time (20 mins)	Easy	Moderate	Difficult	Total Items
	35	31	14	80

An Item with 50% difficulty, level is considered to be an ideal test item. However research shows that items with discriminations indices ranging from 16% to 84% could be included preferably. To this item analysis researches followed these criteria. However some expert of the field such as Ebel and Frisbie (1986, P. 324) also accept it as valid beyond this range. But in no case items with discrimination indices less than or equal to zero were accepted.

Total No. of Items in Test = 80

Item difficulty index = $$P = \frac{N_p}{N}$$

NP – Indicates the number of test takers in total group who passed the item = 17

N – Indicates the total number of test takers in the group = 383

The item difficulty index (P) has a range of 0.00 to 1.00. If no one answers the item correctly, P value would be 0.00. An item that everyone answer correctly would have a P value of 1.00

Item: Discrimination Index is $$D = \frac{U_p - L_p}{U}$$

UP - No. of test takers in upper group LP – No. of test takers in lower group
U – is the total number of test takers in upper group

The optional level for an acceptable P value depends on the no. of options per item. In present test, have 4 options Then g = .25

P value = 1.0 G value = .25

Constant value = 2

$$\frac{1.0 + .25}{2}$$

Optional level = .63

As the number of options increases, the option P – value decreases, these test have more option to also be more difficult to answer.
The difficulty level increases.
After optional level of item: - we get lower Bond

$$\frac{\left[1 + 1.645\sqrt{\frac{(k-1)}{n}}\right]}{k}$$

K= No. of multiple choice item K= 80
N – No. of examiners N = 383

Table 5: items with difficulty level < 16

Items	10,14,15,16,18,19,20,28,38,39,40,41,42,48,49,50,5152, 53,54,55,56,57,58,59,60,61,62,63,64,65,66,68,69,70,72 ,73,74,71,67,75,76,77,78,79,80

Difficulty level <16 means these items are very difficult.

Table 6: of items with difficulty level > 84

Items	1,2,3,4,5,6,7,8,9,11,12,13,17,21,22,23,24,25,26,27,29,3 0,31,32,33,34,35,36,37,43,44,45,46,47,

Difficulty level >84 means that items are very easy because the %age of both high achieve and low achieve is high in these items.

Table 7: Numbers of items with index of discriminations

Items	7,8,15,16,18,19,20,22,23,28,44,45,52,54,55,56,57,58,5 9,60,61,62,68,69,70,73,74,71,67,75,76,77,78,79,80

Ebel&Frisbie (1986) gives us the following role of thumb for determining the quality of the items in terms of the discrimination index

Table 8: Shows the value D and their corresponding interpretation

D	Quality	Recommendation
> 0.39	Excellent	Retain
0.30 – 0.39	Good	Possibilities for improvement
0.20 – 0.29	Mediocre	Need to check/review
0.00 – 0.20	Poor	Discard or reviewing depth
< –0.01	Worst	Definitely Discard

Pearson Correlation Coefficient (r) is used for measuring the linear dependence of two variables.

Pearson Correlation Coefficient Formula:

$$r = \frac{n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i}{\sqrt{(n\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2)(n\sum_{i=1}^{n} y_i^2 - (\sum_{i=1}^{n} y_i)^2)}}$$

Where:

- $\mathbf{x_i}$: the *ith* number of x
- $\mathbf{y_i}$: the *ith* number of y
- **n**: total numbers of x or y

□r: correlation coefficient, -1 <= r <= 1, 1 represents strongly positively correlated, -1 represents strongly negatively correlated, 0 represents no correlation.

Table 9 *Analysis of Reliability* N=383

Reliability	Correlation coefficient	Inference
Test-Retest Method	0.931843	Highly significant

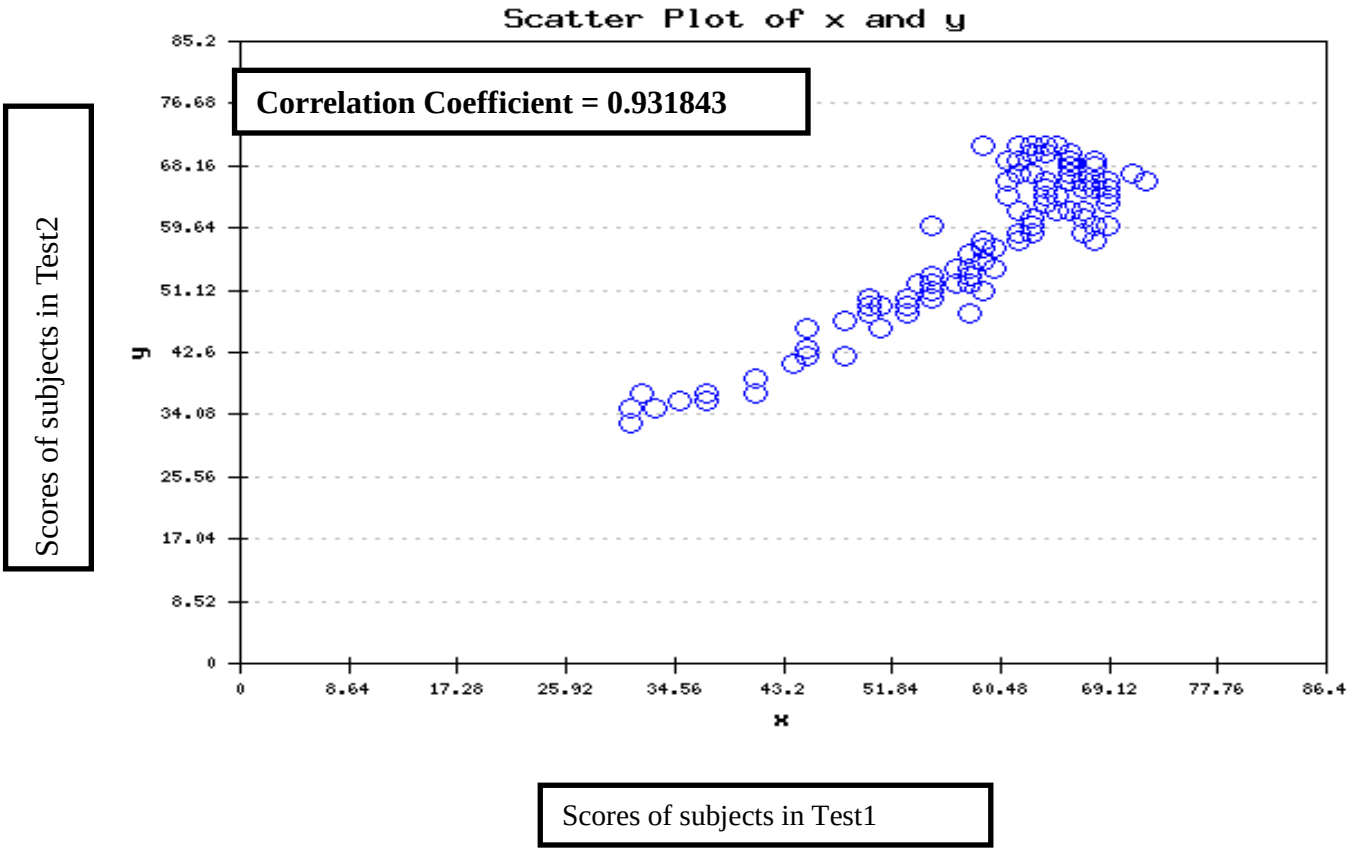

Fig.2 Correlation coefficient of the scores of Test1 and Test2 (n= 383)

Table 10 Estimating Validity through Linear Regression Method

S.No	**Y** (criterion)	X (practical)	predicted	residual	prac-crit	S.no	100logY	100logX	predicted	residual	prac-crit
1.	51	55	52.52	-1.52	4.00	1.	393.2	400.7	396.23	-3.05	7.55
2.	52	55	52.52	-0.52	3.00	2.	395.1	400.7	396.23	-1.11	5.61
3.	54	58	55.18	-1.18	4.00	3.	398.9	406.0	400.98	-2.08	7.15
4.	53	58	55.18	-2.18	5.00	4.	397.0	406.0	400.98	-3.95	9.02
5.	53	58	55.18	-2.18	5.00	5.	397.0	406.0	400.98	-3.95	9.02
6.	56	58	55.18	0.82	2.00	6.	402.5	406.0	400.98	1.56	3.51
7.	58	59	56.06	1.94	1.00	7.	406.0	407.8	402.51	3.54	1.71
8.	54	60	56.95	-2.95	6.00	8.	398.9	409.4	404.01	-5.11	10.54
9.	57	60	56.95	0.05	3.00	9.	404.3	409.4	404.01	0.29	5.13
10.	59	62	58.72	0.28	3.00	10.	407.8	412.7	406.94	0.81	4.96
11.	60	63	59.60	0.40	3.00	11.	409.4	414.3	408.37	1.06	4.88
12.	59	67	63.14	-4.14	8.00	12.	407.8	420.5	413.88	-6.12	12.72
13.	58	68	64.03	-6.03	10.00	13.	406.0	422.0	415.20	-9.16	15.91
14.	66	69	64.91	1.09	3.00	14.	419.0	423.4	416.51	2.46	4.45
15.	55	59	56.06	-1.06	4.00	15.	400.7	407.8	402.51	-1.77	7.02
16.	62	66	62.26	-0.26	4.00	16.	412.7	419.0	412.53	0.18	6.25
17.	60	69	64.91	-4.91	9.00	17.	409.4	423.4	416.51	-7.07	13.98
18.	65	69	64.91	0.09	4.00	18.	417.4	423.4	416.51	0.93	5.97
19.	64	69	64.91	-0.91	5.00	19.	415.9	423.4	416.51	-0.62	7.52
20.	64	61	57.83	6.17	-3.00	20.	415.9	411.1	405.49	10.40	-4.80
21.	54	57	54.29	-0.29	3.00	21.	398.9	404.3	399.42	-0.53	5.41
22.	59	63	59.60	-0.60	4.00	22.	407.8	414.3	408.37	-0.62	6.56
23.	64	69	64.91	-0.91	5.00	23.	415.9	423.4	416.51	-0.62	7.52
24.	62	65	61.37	0.63	3.00	24.	412.7	417.4	411.17	1.55	4.73
25.	37	32	32.17	4.83	-5.00	25.	361.1	346.6	347.80	13.29	-14.52
26.	36	37	36.59	-0.59	1.00	26.	358.4	361.1	360.78	-2.43	2.74
27.	42	45	43.67	-1.67	3.00	27.	373.8	380.7	378.29	-4.52	6.90
28.	49	51	48.98	0.02	2.00	28.	389.2	393.2	389.48	-0.30	4.00
29.	55	59	56.06	-1.06	4.00	29.	400.7	407.8	402.51	-1.77	7.02
30.	57	60	56.95	0.05	3.00	30.	404.3	409.4	404.01	0.29	5.13
31.	65	64	60.49	4.51	-1.00	31.	417.4	415.9	409.78	7.66	-1.55
32.	60	68	64.03	-4.03	8.00	32.	409.4	422.0	415.20	-5.77	12.52
33.	68	68	64.03	3.97	0.00	33.	422.0	422.0	415.20	6.75	0.00
34.	64	64	60.49	3.51	0.00	34.	415.9	415.9	409.78	6.11	0.00
35.	66	68	64.03	1.97	2.00	35.	419.0	422.0	415.20	3.76	2.99
36.	66	69	64.91	1.09	3.00	36.	419.0	423.4	416.51	2.46	4.45
37.	66	68	64.03	1.97	2.00	37.	419.0	422.0	415.20	3.76	2.99
38.	67	62	58.72	8.28	-5.00	38.	420.5	412.7	406.94	13.53	-7.76
39.	51	59	56.06	-5.06	8.00	39.	393.2	407.8	402.51	-9.32	14.57
40.	63	69	64.91	-1.91	6.00	40.	414.3	423.4	416.51	-2.19	9.10
41.	66	61	57.83	8.17	-5.00	41.	419.0	411.1	405.49	13.48	-7.88
42.	64	65	61.37	2.63	1.00	42.	415.9	417.4	411.17	4.72	1.55
43.	69	66	62.26	6.74	-3.00	43.	423.4	419.0	412.53	10.88	-4.45
44.	57	59	56.06	0.94	2.00	44.	404.3	407.8	402.51	1.80	3.45

45.	69	66	62.26	6.74	-3.00	45.	423.4	419.0	412.53	10.88	-4.45
46.	58	62	58.72	-0.72	4.00	46.	406.0	412.7	406.94	-0.90	6.67
47.	52	54	51.64	0.36	2.00	47.	395.1	398.9	394.59	0.53	3.77
48.	46	51	48.98	-2.98	5.00	48.	382.9	393.2	389.48	-6.61	10.32
49.	49	50	48.10	0.90	1.00	49.	389.2	391.2	387.71	1.47	2.02
50.	65	64	60.49	4.51	-1.00	50.	417.4	415.9	409.78	7.66	-1.55
51.	39	41	40.13	-1.13	2.00	51.	366.4	371.4	369.96	-3.61	5.00
52.	52	57	54.29	-2.29	5.00	52.	395.1	404.3	399.42	-4.30	9.18
53.	71	59	56.06	14.94	-12.00	53.	426.3	407.8	402.51	23.76	-18.51
54.	70	63	59.60	10.40	-7.00	54.	424.8	414.3	408.37	16.48	-10.54
55.	37	41	40.13	-3.13	4.00	55.	361.1	371.4	369.96	-8.87	10.27
56.	64	69	64.91	-0.91	5.00	56.	415.9	423.4	416.51	-0.62	7.52
57.	61	63	59.60	1.40	2.00	57.	411.1	414.3	408.37	2.71	3.23
58.	54	57	54.29	-0.29	3.00	58.	398.9	404.3	399.42	-0.53	5.41
59.	59	63	59.60	-0.60	4.00	59.	407.8	414.3	408.37	-0.62	6.56
60.	64	69	64.91	-0.91	5.00	60.	415.9	423.4	416.51	-0.62	7.52
61.	62	65	61.37	0.63	3.00	61.	412.7	417.4	411.17	1.55	4.73
62.	37	32	32.17	4.83	-5.00	62.	361.1	346.6	347.80	13.29	-14.52
63.	36	37	36.59	-0.59	1.00	63.	358.4	361.1	360.78	-2.43	2.74
64.	42	45	43.67	-1.67	3.00	64.	373.8	380.7	378.29	-4.52	6.90
65.	49	51	48.98	0.02	2.00	65.	389.2	393.2	389.48	-0.30	4.00
66.	52	58	55.18	-3.18	6.00	66.	395.1	406.0	400.98	-5.85	10.92
67.	48	58	55.18	-7.18	10.00	67.	387.1	406.0	400.98	-13.86	18.92
68.	59	63	59.60	-0.60	4.00	68.	407.8	414.3	408.37	-0.62	6.56
69.	47	48	46.33	0.67	1.00	69.	385.0	387.1	384.06	0.96	2.11
70.	41	44	42.79	-1.79	3.00	70.	371.4	378.4	376.28	-4.92	7.06
71.	50	55	52.52	-2.52	5.00	71.	391.2	400.7	396.23	-5.03	9.53
72.	55	59	56.06	-1.06	4.00	72.	400.7	407.8	402.51	-1.77	7.02
73.	50	55	52.52	-2.52	5.00	73.	391.2	400.7	396.23	-5.03	9.53
74.	54	58	55.18	-1.18	4.00	74.	398.9	406.0	400.98	-2.08	7.15
75.	66	72	67.57	-1.57	6.00	75.	419.0	427.7	420.31	-1.35	8.70
76.	36	35	34.82	1.18	-1.00	76.	358.4	355.5	355.82	2.54	-2.82
77.	48	50	48.10	-0.10	2.00	77.	387.1	391.2	387.71	-0.59	4.08
78.	58	62	58.72	-0.72	4.00	78.	406.0	412.7	406.94	-0.90	6.67
79.	52	54	51.64	0.36	2.00	79.	395.1	398.9	394.59	0.53	3.77
80.	46	51	48.98	-2.98	5.00	80.	382.9	393.2	389.48	-6.61	10.32
81.	49	50	48.10	0.90	1.00	81.	389.2	391.2	387.71	1.47	2.02
82.	65	64	60.49	4.51	-1.00	82.	417.4	415.9	409.78	7.66	-1.55
83.	39	41	40.13	-1.13	2.00	83.	366.4	371.4	369.96	-3.61	5.00
84.	52	57	54.29	-2.29	5.00	84.	395.1	404.3	399.42	-4.30	9.18
85.	71	63	59.60	11.40	-8.00	85.	426.3	414.3	408.37	17.90	-11.95
86.	70	66	62.26	7.74	-4.00	86.	424.8	419.0	412.53	12.32	-5.88
87.	37	41	40.13	-3.13	4.00	87.	361.1	371.4	369.96	-8.87	10.27
88.	46	45	43.67	2.33	-1.00	88.	382.9	380.7	378.29	4.58	-2.20
89.	60	55	52.52	7.48	-5.00	89.	409.4	400.7	396.23	13.20	-8.70
90.	67	66	62.26	4.74	-1.00	90.	420.5	419.0	412.53	7.94	-1.50
91.	37	37	36.59	0.41	0.00	91.	361.1	361.1	360.78	0.31	0.00
92.	53	55	52.52	0.48	2.00	92.	397.0	400.7	396.23	0.80	3.70
93.	62	67	63.14	-1.14	5.00	93.	412.7	420.5	413.88	-1.16	7.76

94.	67	71	66.68	0.32	4.00	94.	420.5	426.3	419.06	1.41	5.80
95.	69	61	57.83	11.17	-8.00	95.	423.4	411.1	405.49	17.92	-12.32
96.	66	64	60.49	5.51	-2.00	96.	419.0	415.9	409.78	9.18	-3.08
97.	65	67	63.14	1.86	2.00	97.	417.4	420.5	413.88	3.56	3.03
98.	69	68	64.03	4.97	-1.00	98.	423.4	422.0	415.20	8.21	-1.46
99.	65	68	64.03	0.97	3.00	99.	417.4	422.0	415.20	2.24	4.51
100.	63	64	60.49	2.51	1.00	100.	414.3	415.9	409.78	4.53	1.57
101.	33	31	31.28	1.72	-2.00	101.	349.7	343.4	344.96	4.69	-6.25
102.	35	31	31.28	3.72	-4.00	102.	355.5	343.4	344.96	10.57	-12.14
103.	50	53	50.75	-0.75	3.00	103.	391.2	397.0	392.92	-1.72	5.83
104.	51	55	52.52	-1.52	4.00	104.	393.2	400.7	396.23	-3.05	7.55
105.	52	55	52.52	-0.52	3.00	105.	395.1	400.7	396.23	-1.11	5.61
106.	54	58	55.18	-1.18	4.00	106.	398.9	406.0	400.98	-2.08	7.15
107.	53	58	55.18	-2.18	5.00	107.	397.0	406.0	400.98	-3.95	9.02
108.	53	58	55.18	-2.18	5.00	108.	397.0	406.0	400.98	-3.95	9.02
109.	56	58	55.18	0.82	2.00	109.	402.5	406.0	400.98	1.56	3.51
110.	58	59	56.06	1.94	1.00	110.	406.0	407.8	402.51	3.54	1.71
111.	54	60	56.95	-2.95	6.00	111.	398.9	409.4	404.01	-5.11	10.54
112.	57	60	56.95	0.05	3.00	112.	404.3	409.4	404.01	0.29	5.13
113.	59	62	58.72	0.28	3.00	113.	407.8	412.7	406.94	0.81	4.96
114.	60	63	59.60	0.40	3.00	114.	409.4	414.3	408.37	1.06	4.88
115.	59	67	63.14	-4.14	8.00	115.	407.8	420.5	413.88	-6.12	12.72
116.	58	68	64.03	-6.03	10.00	116.	406.0	422.0	415.20	-9.16	15.91
117.	66	69	64.91	1.09	3.00	117.	419.0	423.4	416.51	2.46	4.45
118.	55	59	56.06	-1.06	4.00	118.	400.7	407.8	402.51	-1.77	7.02
119.	62	66	62.26	-0.26	4.00	119.	412.7	419.0	412.53	0.18	6.25
120.	60	69	64.91	-4.91	9.00	120.	409.4	423.4	416.51	-7.07	13.98
121.	50	55	52.52	-2.52	5.00	121.	391.2	400.7	396.23	-5.03	9.53
122.	60	63	59.60	0.40	3.00	122.	409.4	414.3	408.37	1.06	4.88
123.	47	48	46.33	0.67	1.00	123.	385.0	387.1	384.06	0.96	2.11
124.	41	44	42.79	-1.79	3.00	124.	371.4	378.4	376.28	-4.92	7.06
125.	50	55	52.52	-2.52	5.00	125.	391.2	400.7	396.23	-5.03	9.53
126.	60	63	59.60	0.40	3.00	126.	409.4	414.3	408.37	1.06	4.88
127.	62	67	63.14	-1.14	5.00	127.	412.7	420.5	413.88	-1.16	7.76
128.	48	50	48.10	-0.10	2.00	128.	387.1	391.2	387.71	-0.59	4.08
129.	50	50	48.10	1.90	0.00	129.	391.2	391.2	387.71	3.49	0.00
130.	55	59	56.06	-1.06	4.00	130.	400.7	407.8	402.51	-1.77	7.02
131.	50	55	52.52	-2.52	5.00	131.	391.2	400.7	396.23	-5.03	9.53
132.	54	58	55.18	-1.18	4.00	132.	398.9	406.0	400.98	-2.08	7.15
133.	66	72	67.57	-1.57	6.00	133.	419.0	427.7	420.31	-1.35	8.70
134.	36	35	34.82	1.18	-1.00	134.	358.4	355.5	355.82	2.54	-2.82
135.	48	50	48.10	-0.10	2.00	135.	387.1	391.2	387.71	-0.59	4.08
136.	58	62	58.72	-0.72	4.00	136.	406.0	412.7	406.94	-0.90	6.67
137.	52	54	51.64	0.36	2.00	137.	395.1	398.9	394.59	0.53	3.77
138.	46	51	48.98	-2.98	5.00	138.	382.9	393.2	389.48	-6.61	10.32
139.	49	50	48.10	0.90	1.00	139.	389.2	391.2	387.71	1.47	2.02
140.	65	64	60.49	4.51	-1.00	140.	417.4	415.9	409.78	7.66	-1.55
141.	39	41	40.13	-1.13	2.00	141.	366.4	371.4	369.96	-3.61	5.00
142.	52	57	54.29	-2.29	5.00	142.	395.1	404.3	399.42	-4.30	9.18

143.	71	64	60.49	10.51	-7.00	143.	426.3	415.9	409.78	16.49	-10.38
144.	70	64	60.49	9.51	-6.00	144.	424.8	415.9	409.78	15.07	-8.96
145.	37	41	40.13	-3.13	4.00	145.	361.1	371.4	369.96	-8.87	10.27
146.	46	45	43.67	2.33	-1.00	146.	382.9	380.7	378.29	4.58	-2.20
147.	43	45	43.67	-0.67	2.00	147.	376.1	380.7	378.29	-2.17	4.55
148.	47	48	46.33	0.67	1.00	148.	385.0	387.1	384.06	0.96	2.11
149.	42	48	46.33	-4.33	6.00	149.	373.8	387.1	384.06	-10.29	13.35
150.	48	53	50.75	-2.75	5.00	150.	387.1	397.0	392.92	-5.80	9.91
151.	49	53	50.75	-1.75	4.00	151.	389.2	397.0	392.92	-3.74	7.85
152.	50	53	50.75	-0.75	3.00	152.	391.2	397.0	392.92	-1.72	5.83
153.	49	50	48.10	0.90	1.00	153.	389.2	391.2	387.71	1.47	2.02
154.	65	64	60.49	4.51	-1.00	154.	417.4	415.9	409.78	7.66	-1.55
155.	66	69	64.91	1.09	3.00	155.	419.0	423.4	416.51	2.46	4.45
156.	55	59	56.06	-1.06	4.00	156.	400.7	407.8	402.51	-1.77	7.02
157.	62	66	62.26	-0.26	4.00	157.	412.7	419.0	412.53	0.18	6.25
158.	60	69	64.91	-4.91	9.00	158.	409.4	423.4	416.51	-7.07	13.98
159.	65	69	64.91	0.09	4.00	159.	417.4	423.4	416.51	0.93	5.97
160.	66	68	64.03	1.97	2.00	160.	419.0	422.0	415.20	3.76	2.99
161.	66	61	57.83	8.17	-5.00	161.	419.0	411.1	405.49	13.48	-7.88
162.	69	66	62.26	6.74	-3.00	162.	423.4	419.0	412.53	10.88	-4.45
163.	57	59	56.06	0.94	2.00	163.	404.3	407.8	402.51	1.80	3.45
164.	69	61	57.83	11.17	-8.00	164.	423.4	411.1	405.49	17.92	-12.32
165.	65	67	63.14	1.86	2.00	165.	417.4	420.5	413.88	3.56	3.03
166.	69	68	64.03	4.97	-1.00	166.	423.4	422.0	415.20	8.21	-1.46
167.	65	68	64.03	0.97	3.00	167.	417.4	422.0	415.20	2.24	4.51
168.	67	63	59.60	7.40	-4.00	168.	420.5	414.3	408.37	12.10	-6.16
169.	33	31	31.28	1.72	-2.00	169.	349.7	343.4	344.96	4.69	-6.25
170.	35	31	31.28	3.72	-4.00	170.	355.5	343.4	344.96	10.57	-12.14
171.	50	53	50.75	-0.75	3.00	171.	391.2	397.0	392.92	-1.72	5.83
172.	51	55	52.52	-1.52	4.00	172.	393.2	400.7	396.23	-3.05	7.55
173.	52	55	52.52	-0.52	3.00	173.	395.1	400.7	396.23	-1.11	5.61
174.	54	58	55.18	-1.18	4.00	174.	398.9	406.0	400.98	-2.08	7.15
175.	53	58	55.18	-2.18	5.00	175.	397.0	406.0	400.98	-3.95	9.02
176.	53	58	55.18	-2.18	5.00	176.	397.0	406.0	400.98	-3.95	9.02
177.	56	58	55.18	0.82	2.00	177.	402.5	406.0	400.98	1.56	3.51
178.	58	59	56.06	1.94	1.00	178.	406.0	407.8	402.51	3.54	1.71
179.	54	60	56.95	-2.95	6.00	179.	398.9	409.4	404.01	-5.11	10.54
180.	57	60	56.95	0.05	3.00	180.	404.3	409.4	404.01	0.29	5.13
181.	59	62	58.72	0.28	3.00	181.	407.8	412.7	406.94	0.81	4.96
182.	60	63	59.60	0.40	3.00	182.	409.4	414.3	408.37	1.06	4.88
183.	59	67	63.14	-4.14	8.00	183.	407.8	420.5	413.88	-6.12	12.72
184.	58	68	64.03	-6.03	10.00	184.	406.0	422.0	415.20	-9.16	15.91
185.	66	69	64.91	1.09	3.00	185.	419.0	423.4	416.51	2.46	4.45
186.	55	59	56.06	-1.06	4.00	186.	400.7	407.8	402.51	-1.77	7.02
187.	62	66	62.26	-0.26	4.00	187.	412.7	419.0	412.53	0.18	6.25
188.	60	69	64.91	-4.91	9.00	188.	409.4	423.4	416.51	-7.07	13.98
189.	50	55	52.52	-2.52	5.00	189.	391.2	400.7	396.23	-5.03	9.53
190.	60	63	59.60	0.40	3.00	190.	409.4	414.3	408.37	1.06	4.88
191.	62	67	63.14	-1.14	5.00	191.	412.7	420.5	413.88	-1.16	7.76

192.	48	50	48.10	-0.10	2.00	192.	387.1	391.2	387.71	-0.59	4.08
193.	50	50	48.10	1.90	0.00	193.	391.2	391.2	387.71	3.49	0.00
194.	55	59	56.06	-1.06	4.00	194.	400.7	407.8	402.51	-1.77	7.02
195.	50	55	52.52	-2.52	5.00	195.	391.2	400.7	396.23	-5.03	9.53
196.	54	58	55.18	-1.18	4.00	196.	398.9	406.0	400.98	-2.08	7.15
197.	66	72	67.57	-1.57	6.00	197.	419.0	427.7	420.31	-1.35	8.70
198.	36	35	34.82	1.18	-1.00	198.	358.4	355.5	355.82	2.54	-2.82
199.	48	50	48.10	-0.10	2.00	199.	387.1	391.2	387.71	-0.59	4.08
200.	48	58	55.18	-7.18	10.00	200.	387.1	406.0	400.98	-13.86	18.92
201.	59	63	59.60	-0.60	4.00	201.	407.8	414.3	408.37	-0.62	6.56
202.	47	48	46.33	0.67	1.00	202.	385.0	387.1	384.06	0.96	2.11
203.	41	44	42.79	-1.79	3.00	203.	371.4	378.4	376.28	-4.92	7.06
204.	50	55	52.52	-2.52	5.00	204.	391.2	400.7	396.23	-5.03	9.53
205.	60	63	59.60	0.40	3.00	205.	409.4	414.3	408.37	1.06	4.88
206.	62	67	63.14	-1.14	5.00	206.	412.7	420.5	413.88	-1.16	7.76
207.	48	50	48.10	-0.10	2.00	207.	387.1	391.2	387.71	-0.59	4.08
208.	50	50	48.10	1.90	0.00	208.	391.2	391.2	387.71	3.49	0.00
209.	55	59	56.06	-1.06	4.00	209.	400.7	407.8	402.51	-1.77	7.02
210.	50	55	52.52	-2.52	5.00	210.	391.2	400.7	396.23	-5.03	9.53
211.	54	58	55.18	-1.18	4.00	211.	398.9	406.0	400.98	-2.08	7.15
212.	66	72	67.57	-1.57	6.00	212.	419.0	427.7	420.31	-1.35	8.70
213.	36	35	34.82	1.18	-1.00	213.	358.4	355.5	355.82	2.54	-2.82
214.	48	50	48.10	-0.10	2.00	214.	387.1	391.2	387.71	-0.59	4.08
215.	58	62	58.72	-0.72	4.00	215.	406.0	412.7	406.94	-0.90	6.67
216.	52	54	51.64	0.36	2.00	216.	395.1	398.9	394.59	0.53	3.77
217.	46	51	48.98	-2.98	5.00	217.	382.9	393.2	389.48	-6.61	10.32
218.	53	58	55.18	-2.18	5.00	218.	397.0	406.0	400.98	-3.95	9.02
219.	56	58	55.18	0.82	2.00	219.	402.5	406.0	400.98	1.56	3.51
220.	58	59	56.06	1.94	1.00	220.	406.0	407.8	402.51	3.54	1.71
221.	54	60	56.95	-2.95	6.00	221.	398.9	409.4	404.01	-5.11	10.54
222.	57	60	56.95	0.05	3.00	222.	404.3	409.4	404.01	0.29	5.13
223.	59	62	58.72	0.28	3.00	223.	407.8	412.7	406.94	0.81	4.96
224.	60	63	59.60	0.40	3.00	224.	409.4	414.3	408.37	1.06	4.88
225.	59	67	63.14	-4.14	8.00	225.	407.8	420.5	413.88	-6.12	12.72
226.	58	68	64.03	-6.03	10.00	226.	406.0	422.0	415.20	-9.16	15.91
227.	66	69	64.91	1.09	3.00	227.	419.0	423.4	416.51	2.46	4.45
228.	55	59	56.06	-1.06	4.00	228.	400.7	407.8	402.51	-1.77	7.02
229.	62	66	62.26	-0.26	4.00	229.	412.7	419.0	412.53	0.18	6.25
230.	60	69	64.91	-4.91	9.00	230.	409.4	423.4	416.51	-7.07	13.98
231.	65	69	64.91	0.09	4.00	231.	417.4	423.4	416.51	0.93	5.97
232.	64	69	64.91	-0.91	5.00	232.	415.9	423.4	416.51	-0.62	7.52
233.	64	65	61.37	2.63	1.00	233.	415.9	417.4	411.17	4.72	1.55
234.	54	57	54.29	-0.29	3.00	234.	398.9	404.3	399.42	-0.53	5.41
235.	59	63	59.60	-0.60	4.00	235.	407.8	414.3	408.37	-0.62	6.56
236.	64	69	64.91	-0.91	5.00	236.	415.9	423.4	416.51	-0.62	7.52
237.	62	65	61.37	0.63	3.00	237.	412.7	417.4	411.17	1.55	4.73
238.	37	32	32.17	4.83	-5.00	238.	361.1	346.6	347.80	13.29	-14.52
239.	36	37	36.59	-0.59	1.00	239.	358.4	361.1	360.78	-2.43	2.74
240.	42	45	43.67	-1.67	3.00	240.	373.8	380.7	378.29	-4.52	6.90

241.	49	51	48.98	0.02	2.00	241.	389.2	393.2	389.48	-0.30	4.00
242.	52	58	55.18	-3.18	6.00	242.	395.1	406.0	400.98	-5.85	10.92
243.	35	33	33.05	1.95	-2.00	243.	355.5	349.7	350.55	4.98	-5.88
244.	52	58	55.18	-3.18	6.00	244.	395.1	406.0	400.98	-5.85	10.92
245.	48	58	55.18	-7.18	10.00	245.	387.1	406.0	400.98	-13.86	18.92
246.	59	63	59.60	-0.60	4.00	246.	407.8	414.3	408.37	-0.62	6.56
247.	46	45	43.67	2.33	-1.00	247.	382.9	380.7	378.29	4.58	-2.20
248.	43	45	43.67	-0.67	2.00	248.	376.1	380.7	378.29	-2.17	4.55
249.	47	48	46.33	0.67	1.00	249.	385.0	387.1	384.06	0.96	2.11
250.	42	48	46.33	-4.33	6.00	250.	373.8	387.1	384.06	-10.29	13.35
251.	48	53	50.75	-2.75	5.00	251.	387.1	397.0	392.92	-5.80	9.91
252.	49	53	50.75	-1.75	4.00	252.	389.2	397.0	392.92	-3.74	7.85
253.	50	53	50.75	-0.75	3.00	253.	391.2	397.0	392.92	-1.72	5.83
254.	51	55	52.52	-1.52	4.00	254.	393.2	400.7	396.23	-3.05	7.55
255.	52	55	52.52	-0.52	3.00	255.	395.1	400.7	396.23	-1.11	5.61
256.	54	58	55.18	-1.18	4.00	256.	398.9	406.0	400.98	-2.08	7.15
257.	53	58	55.18	-2.18	5.00	257.	397.0	406.0	400.98	-3.95	9.02
258.	71	65	61.37	9.63	-6.00	258.	426.3	417.4	411.17	15.10	-8.83
259.	66	64	60.49	5.51	-2.00	259.	419.0	415.9	409.78	9.18	-3.08
260.	37	37	36.59	0.41	0.00	260.	361.1	361.1	360.78	0.31	0.00
261.	53	55	52.52	0.48	2.00	261.	397.0	400.7	396.23	0.80	3.70
262.	62	67	63.14	-1.14	5.00	262.	412.7	420.5	413.88	-1.16	7.76
263.	67	71	66.68	0.32	4.00	263.	420.5	426.3	419.06	1.41	5.80
264.	69	62	58.72	10.28	-7.00	264.	423.4	412.7	406.94	16.47	-10.70
265.	62	62	58.72	3.28	0.00	265.	412.7	412.7	406.94	5.77	0.00
266.	43	45	43.67	-0.67	2.00	266.	376.1	380.7	378.29	-2.17	4.55
267.	47	48	46.33	0.67	1.00	267.	385.0	387.1	384.06	0.96	2.11
268.	42	48	46.33	-4.33	6.00	268.	373.8	387.1	384.06	-10.29	13.35
269.	48	53	50.75	-2.75	5.00	269.	387.1	397.0	392.92	-5.80	9.91
270.	49	53	50.75	-1.75	4.00	270.	389.2	397.0	392.92	-3.74	7.85
271.	50	53	50.75	-0.75	3.00	271.	391.2	397.0	392.92	-1.72	5.83
272.	51	55	52.52	-1.52	4.00	272.	393.2	400.7	396.23	-3.05	7.55
273.	52	55	52.52	-0.52	3.00	273.	395.1	400.7	396.23	-1.11	5.61
274.	54	58	55.18	-1.18	4.00	274.	398.9	406.0	400.98	-2.08	7.15
275.	53	58	55.18	-2.18	5.00	275.	397.0	406.0	400.98	-3.95	9.02
276.	53	58	55.18	-2.18	5.00	276.	397.0	406.0	400.98	-3.95	9.02
277.	56	58	55.18	0.82	2.00	277.	402.5	406.0	400.98	1.56	3.51
278.	58	59	56.06	1.94	1.00	278.	406.0	407.8	402.51	3.54	1.71
279.	54	60	56.95	-2.95	6.00	279.	398.9	409.4	404.01	-5.11	10.54
280.	57	60	56.95	0.05	3.00	280.	404.3	409.4	404.01	0.29	5.13
281.	59	62	58.72	0.28	3.00	281.	407.8	412.7	406.94	0.81	4.96
282.	60	63	59.60	0.40	3.00	282.	409.4	414.3	408.37	1.06	4.88
283.	59	67	63.14	-4.14	8.00	283.	407.8	420.5	413.88	-6.12	12.72
284.	58	68	64.03	-6.03	10.00	284.	406.0	422.0	415.20	-9.16	15.91
285.	66	69	64.91	1.09	3.00	285.	419.0	423.4	416.51	2.46	4.45
286.	55	59	56.06	-1.06	4.00	286.	400.7	407.8	402.51	-1.77	7.02
287.	62	66	62.26	-0.26	4.00	287.	412.7	419.0	412.53	0.18	6.25
288.	60	69	64.91	-4.91	9.00	288.	409.4	423.4	416.51	-7.07	13.98
289.	65	69	64.91	0.09	4.00	289.	417.4	423.4	416.51	0.93	5.97

290.	64	69	64.91	-0.91	5.00	290.	415.9	423.4	416.51	-0.62	7.52
291.	62	66	62.26	-0.26	4.00	291.	412.7	419.0	412.53	0.18	6.25
292.	54	57	54.29	-0.29	3.00	292.	398.9	404.3	399.42	-0.53	5.41
293.	59	63	59.60	-0.60	4.00	293.	407.8	414.3	408.37	-0.62	6.56
294.	64	69	64.91	-0.91	5.00	294.	415.9	423.4	416.51	-0.62	7.52
295.	62	65	61.37	0.63	3.00	295.	412.7	417.4	411.17	1.55	4.73
296.	37	32	32.17	4.83	-5.00	296.	361.1	346.6	347.80	13.29	-14.52
297.	36	37	36.59	-0.59	1.00	297.	358.4	361.1	360.78	-2.43	2.74
298.	42	45	43.67	-1.67	3.00	298.	373.8	380.7	378.29	-4.52	6.90
299.	49	51	48.98	0.02	2.00	299.	389.2	393.2	389.48	-0.30	4.00
300.	55	59	56.06	-1.06	4.00	300.	400.7	407.8	402.51	-1.77	7.02
301.	57	60	56.95	0.05	3.00	301.	404.3	409.4	404.01	0.29	5.13
302.	65	64	60.49	4.51	-1.00	302.	417.4	415.9	409.78	7.66	-1.55
303.	60	68	64.03	-4.03	8.00	303.	409.4	422.0	415.20	-5.77	12.52
304.	68	66	62.26	5.74	-2.00	304.	422.0	419.0	412.53	9.42	-2.99
305.	66	66	62.26	3.74	0.00	305.	419.0	419.0	412.53	6.43	0.00
306.	66	68	64.03	1.97	2.00	306.	419.0	422.0	415.20	3.76	2.99
307.	66	69	64.91	1.09	3.00	307.	419.0	423.4	416.51	2.46	4.45
308.	66	67	63.14	2.86	1.00	308.	419.0	420.5	413.88	5.09	1.50
309.	67	63	59.60	7.40	-4.00	309.	420.5	414.3	408.37	12.10	-6.16
310.	51	59	56.06	-5.06	8.00	310.	393.2	407.8	402.51	-9.32	14.57
311.	63	69	64.91	-1.91	6.00	311.	414.3	423.4	416.51	-2.19	9.10
312.	62	67	63.14	-1.14	5.00	312.	412.7	420.5	413.88	-1.16	7.76
313.	48	50	48.10	-0.10	2.00	313.	387.1	391.2	387.71	-0.59	4.08
314.	50	50	48.10	1.90	0.00	314.	391.2	391.2	387.71	3.49	0.00
315.	55	59	56.06	-1.06	4.00	315.	400.7	407.8	402.51	-1.77	7.02
316.	50	55	52.52	-2.52	5.00	316.	391.2	400.7	396.23	-5.03	9.53
317.	54	58	55.18	-1.18	4.00	317.	398.9	406.0	400.98	-2.08	7.15
318.	66	72	67.57	-1.57	6.00	318.	419.0	427.7	420.31	-1.35	8.70
319.	36	35	34.82	1.18	-1.00	319.	358.4	355.5	355.82	2.54	-2.82
320.	48	50	48.10	-0.10	2.00	320.	387.1	391.2	387.71	-0.59	4.08
321.	58	62	58.72	-0.72	4.00	321.	406.0	412.7	406.94	-0.90	6.67
322.	52	54	51.64	0.36	2.00	322.	395.1	398.9	394.59	0.53	3.77
323.	46	51	48.98	-2.98	5.00	323.	382.9	393.2	389.48	-6.61	10.32
324.	49	50	48.10	0.90	1.00	324.	389.2	391.2	387.71	1.47	2.02
325.	65	64	60.49	4.51	-1.00	325.	417.4	415.9	409.78	7.66	-1.55
326.	39	41	40.13	-1.13	2.00	326.	366.4	371.4	369.96	-3.61	5.00
327.	52	57	54.29	-2.29	5.00	327.	395.1	404.3	399.42	-4.30	9.18
328.	71	62	58.72	12.28	-9.00	328.	426.3	412.7	406.94	19.33	-13.55
329.	70	64	60.49	9.51	-6.00	329.	424.8	415.9	409.78	15.07	-8.96
330.	37	41	40.13	-3.13	4.00	330.	361.1	371.4	369.96	-8.87	10.27
331.	46	45	43.67	2.33	-1.00	331.	382.9	380.7	378.29	4.58	-2.20
332.	43	45	43.67	-0.67	2.00	332.	376.1	380.7	378.29	-2.17	4.55
333.	47	48	46.33	0.67	1.00	333.	385.0	387.1	384.06	0.96	2.11
334.	42	48	46.33	-4.33	6.00	334.	373.8	387.1	384.06	-10.29	13.35
335.	48	53	50.75	-2.75	5.00	335.	387.1	397.0	392.92	-5.80	9.91
336.	49	53	50.75	-1.75	4.00	336.	389.2	397.0	392.92	-3.74	7.85
337.	50	53	50.75	-0.75	3.00	337.	391.2	397.0	392.92	-1.72	5.83
338.	51	55	52.52	-1.52	4.00	338.	393.2	400.7	396.23	-3.05	7.55

339.	52	55	52.52	-0.52	3.00	339.	395.1	400.7	396.23	-1.11	5.61
340.	54	58	55.18	-1.18	4.00	340.	398.9	406.0	400.98	-2.08	7.15
341.	53	58	55.18	-2.18	5.00	341.	397.0	406.0	400.98	-3.95	9.02
342.	53	58	55.18	-2.18	5.00	342.	397.0	406.0	400.98	-3.95	9.02
343.	56	58	55.18	0.82	2.00	343.	402.5	406.0	400.98	1.56	3.51
344.	58	59	56.06	1.94	1.00	344.	406.0	407.8	402.51	3.54	1.71
345.	54	60	56.95	-2.95	6.00	345.	398.9	409.4	404.01	-5.11	10.54
346.	57	60	56.95	0.05	3.00	346.	404.3	409.4	404.01	0.29	5.13
347.	59	62	58.72	0.28	3.00	347.	407.8	412.7	406.94	0.81	4.96
348.	60	63	59.60	0.40	3.00	348.	409.4	414.3	408.37	1.06	4.88
349.	59	67	63.14	-4.14	8.00	349.	407.8	420.5	413.88	-6.12	12.72
350.	58	68	64.03	-6.03	10.00	350.	406.0	422.0	415.20	-9.16	15.91
351.	66	69	64.91	1.09	3.00	351.	419.0	423.4	416.51	2.46	4.45
352.	55	59	56.06	-1.06	4.00	352.	400.7	407.8	402.51	-1.77	7.02
353.	62	66	62.26	-0.26	4.00	353.	412.7	419.0	412.53	0.18	6.25
354.	60	69	64.91	-4.91	9.00	354.	409.4	423.4	416.51	-7.07	13.98
355.	65	69	64.91	0.09	4.00	355.	417.4	423.4	416.51	0.93	5.97
356.	64	69	64.91	-0.91	5.00	356.	415.9	423.4	416.51	-0.62	7.52
357.	61	67	63.14	-2.14	6.00	357.	411.1	420.5	413.88	-2.79	9.38
358.	54	57	54.29	-0.29	3.00	358.	398.9	404.3	399.42	-0.53	5.41
359.	59	63	59.60	-0.60	4.00	359.	407.8	414.3	408.37	-0.62	6.56
360.	64	69	64.91	-0.91	5.00	360.	415.9	423.4	416.51	-0.62	7.52
361.	62	65	61.37	0.63	3.00	361.	412.7	417.4	411.17	1.55	4.73
362.	37	32	32.17	4.83	-5.00	362.	361.1	346.6	347.80	13.29	-14.52
363.	36	37	36.59	-0.59	1.00	363.	358.4	361.1	360.78	-2.43	2.74
364.	42	45	43.67	-1.67	3.00	364.	373.8	380.7	378.29	-4.52	6.90
365.	49	51	48.98	0.02	2.00	365.	389.2	393.2	389.48	-0.30	4.00
366.	52	58	55.18	-3.18	6.00	366.	395.1	406.0	400.98	-5.85	10.92
367.	48	58	55.18	-7.18	10.00	367.	387.1	406.0	400.98	-13.86	18.92
368.	59	63	59.60	-0.60	4.00	368.	407.8	414.3	408.37	-0.62	6.56
369.	47	48	46.33	0.67	1.00	369.	385.0	387.1	384.06	0.96	2.11
370.	41	44	42.79	-1.79	3.00	370.	371.4	378.4	376.28	-4.92	7.06
371.	50	55	52.52	-2.52	5.00	371.	391.2	400.7	396.23	-5.03	9.53
372.	60	63	59.60	0.40	3.00	372.	409.4	414.3	408.37	1.06	4.88
373.	62	67	63.14	-1.14	5.00	373.	412.7	420.5	413.88	-1.16	7.76
374.	48	50	48.10	-0.10	2.00	374.	387.1	391.2	387.71	-0.59	4.08
375.	50	50	48.10	1.90	0.00	375.	391.2	391.2	387.71	3.49	0.00
376.	55	59	56.06	-1.06	4.00	376.	400.7	407.8	402.51	-1.77	7.02
377.	50	55	52.52	-2.52	5.00	377.	391.2	400.7	396.23	-5.03	9.53
378.	54	58	55.18	-1.18	4.00	378.	398.9	406.0	400.98	-2.08	7.15
379.	66	72	67.57	-1.57	6.00	379.	419.0	427.7	420.31	-1.35	8.70
380.	36	35	34.82	1.18	-1.00	380.	358.4	355.5	355.82	2.54	-2.82
381.	48	50	48.10	-0.10	2.00	381.	387.1	391.2	387.71	-0.59	4.08
382.	58	62	58.72	-0.72	4.00	382.	406.0	412.7	406.94	-0.90	6.67
383.	52	54	51.64	0.36	2.00	383.	395.1	398.9	394.59	0.53	-3.77
Mean	54.9	57.6			2.78	Back-trans mean	54.1	56.8			4.9
SD	8.9	9.4			3.41	SD as a CV (%)	18.9	20.0			6.2
N	383	383				N	383	383			
ΣX^2		33606				ΣX^2		127205			

Table 11 Measures of Validity of Raw Variables and log Transformed Variables.

Calibration equation: Y = intercept + slope*X	Estimate	Lower CL	Upper CL	±CL	approx. ×/÷CL
intercept	3.850	1.823	5.878	2.027	
slope	0.885	0.850	0.920	0.035	
Enter an X value here:	62.00				
Predicted (estimated) Y at X	58.72	52.34	65.09	6.37	
Bias at X value					
in raw units	3.28	2.92	3.64	0.36	
standardized	0.37	0.33	0.41	0.04	
Overall bias					
Mean bias in raw units	2.78	2.44	3.12	0.34	
Mean bias standardized	0.31	0.27	0.35	0.04	
SD of bias in raw units	3.41	3.18	3.67		1.07
SD of bias standardized	0.38	0.36	0.41		1.07
Typical error of estimate	Estimate	Lower CL	Upper CL		
in raw units	**3.24**	3.02	3.48		1.07
standardized	**0.36**	0.34	0.39		1.07
PRRES error	10.47				
	Estimate	Lower CL	Upper CL	approx. ±CL	
Pearson correlation	**0.93**	0.92	0.94	0.01	
Bland-Altman	Estimate				
95% limits of agreement	0.01				
"Total" or "pure" error	0.01				

Calibration equation: Y = aX^b	Estimate	Lower CL	Upper CL	×/÷ CL	± CL
a	1.461	1.286	1.659	1.14	-
b	0.894	0.863	0.926	-	0.031
Enter an X value here:	380.00				
Predicted (estimated) Y at X	296.06	260.64	336.29	1.14	
Bias at X value					
as a %	28.4	20.9	36.3	-	7.7
as a factor	1.284	1.209	1.363	1.062	-
standardized	1.44	1.10	1.79	-	0.35
Overall bias					
Mean bias as a %	5.1	4.3	5.6	-	0.6
Mean bias as a factor	1.051	1.043	1.056	1.006	-
Mean bias standardized	0.28	0.24	0.31	-	0.04
SD of bias as a %	6.4	6.0	6.9	1.08	
SD of bias as a factor	1.064	1.060	1.069	1.004	
SD of bias standardized	0.36	0.34	0.39	1.07	
Typical error of estimate	Estimate	Lower CL	Upper CL	approx. ×/÷CL	
as a CV (%)	**5.9**	5.5	6.3	1.08	
as a ×/÷ factor	**1.059**	1.055	1.063	1.004	
standardized	**0.33**	0.31	0.36	1.07	
PRRES error (%)	5.9				
	Estimate	Lower CL	Upper CL		approx. ±CL
Pearson correlation	**0.94**	0.93	0.95		0.01
Bland-Altman	Estimate				
95% limits of agreement (%)	12.2				
"Total" or "pure" error (%)	6.2				

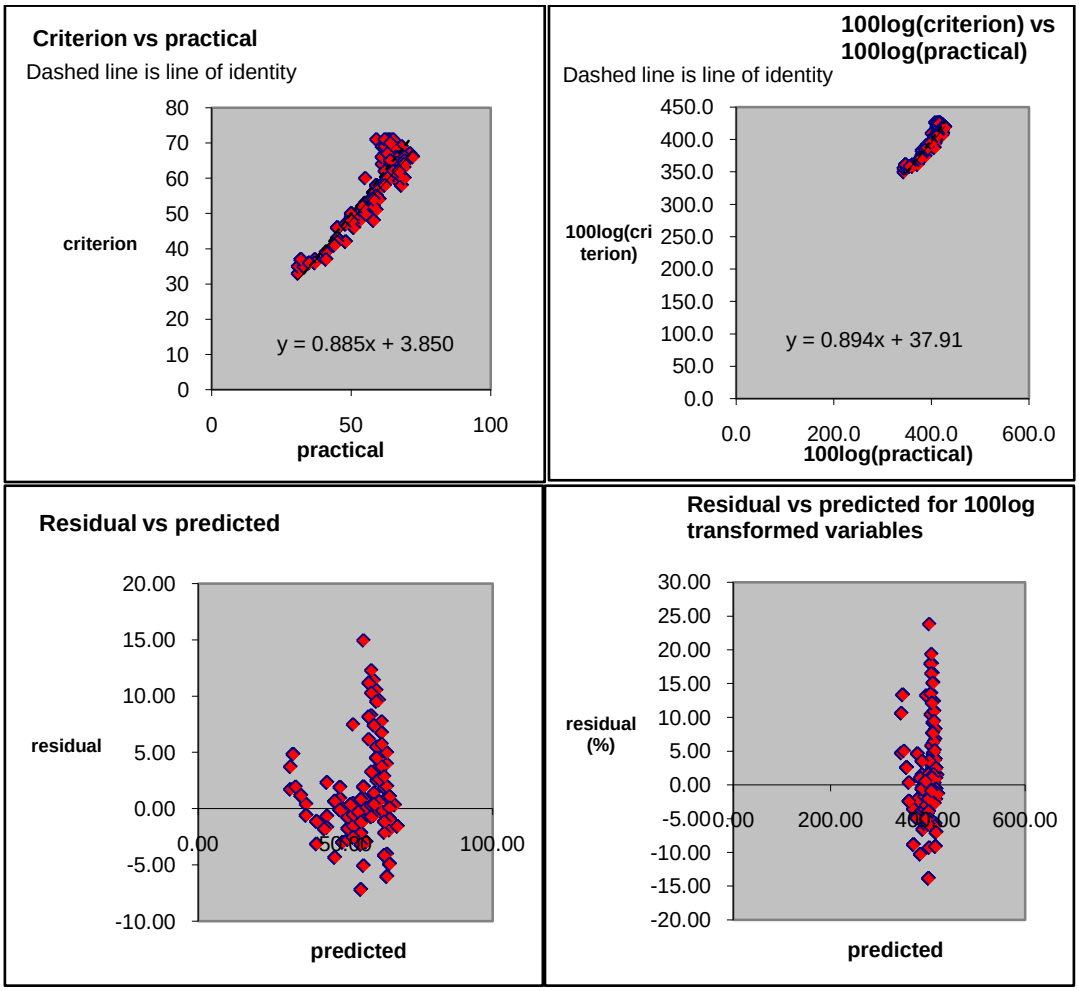

Fig.3 Validity via Linear Regression Method

CONCLUSION

In a nutshell, the study came out with significant results as the correlation coefficient was found to be significantly high witnessing the high reliability and validity of the test. It was notified that there are many factors along with IQ that have a great impact on the individual. These factors like Focus, Decision Making Ability, Creativity, Passion, Judgment, Estimation Level, and Nature of Work & Professional Choice must be taken into consideration being more psychological nature than statistical. The study aided in the development & standardization of Development, item analysis and standardization of the Teachers Cognitive Ability Test. The objective of the research was achieved as a product intended to provide an insight into those scientific methodologies that can help us measure and reorder human intelligence to enhance cognitive factors among teachers by filling the gaps, to produce successful and efficient teachers. The test would help in the identification, measurement and analysis of core cognitive ability factors that determine success in teaching. The reliability was estimated through Test-Retest Method (Table 9 and Fig 2). The validity was estimated via linear regression method (Table 10,11 and Fig 3). The study came out with significant outputs as the correlation coefficient was

found to be significantly high witnessing the high validity and reliability of the test.

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