Item Analysis on Distractor's Mean Ability Index of Katsina State 2019 Basic Education Certificate Examination in Mathematics: Implications for Policy and Practice for Life-Long Skills in Measuring Learning Achievement in Education

Aminu Yusuf[1], Muhammad Ibrahim Yakasai (Prof) [2] & Nuruddeen Lawal[3]

[1] Department of Education Foundations, Abubakar Tafawa Balewa, University, Bauchi-Nigeria.
yaminu@atbu.edu.ng.08080355121
[2]Department of Education, Bayero University, Kano-Nigeria
yakasai@gmail.com08037039759
[3] Institute of Education, University of Abuja- Nigeria. 09091360143,
lawalnuruddeen1957@gmail.com

Abstract

The study determined the estimates of item distractor mean ability index of Katsina State 2019 Basic Education Certificate Examination (BECE) in Mathematics. A maximum number of candidates who endorsed correct/wrong options and the corresponding estimate of mean ability index; items with the same estimate of mean ability index for endorsing correct and wrong options were among the objectives of the study. An Ex-post facto design was used for the study. The population of the study consist of all 65,773 (40,804 males and 24,969 females) candidates that sat for the 2019/2020 Academic Session BECE in Mathematics whose Mean $_{age}$ stood at 14 years. Multi-stage (random; proportionate stratify) sampling techniques were used to sample 500 candidates. The last stage of the sampling involved the selection of the top 75% and bottom 25% of the 500 candidates' scores which constituted the total of 334 high and low achievers used in the study. The data for the study was obtained from the BECE in mathematics for the 2019/2020 Academic session marked scripts. The estimates from the study were generated and analyzed using WINSTEPS version 4.8.2.0 software and Spreadsheet excel. The maximum number of candidates that endorsed the correct option is 291(87%) and the wrong option is 43(13%) which corresponds to item 4; 24 (40%) of two items each and 9 (15%) of three items each have the same mean ability index for endorsing correct and wrong options were among the findings from the study. Implications of the findings were discussed, and recommendations were made based on the findings of the study.

Keywords: Item Analysis, BECE, Range from an estimate of mean ability, Distractor

Introduction

Item analysis is a process of judging the worthiness or otherwise of a test item's contribution to other items in measuring the psychometric properties for which the test intends to measure. In 2019 Sonone et al defined item analysis as a set of qualitative and quantitative techniques and procedures used to evaluate the characteristics of an item of the test before and after test development and construction. The two main approaches to test theory Classical test theory (CCT) and Item response theory (IRT) are similar in approach but differ slightly in the technic of test item analysis. Although, psychometrics and researchers relied mostly on the CTT approach in determining the psychometric properties of test items than the IRT approach which many viewed it as complex because of the mathematics skill needed to operate most of the IRT soft wares. However, with recent tutorials on how to operate the IRT soft wares such as Winsteps, XCalibre, and irtPro just to mention a few there is a shift toward the use of such computer soft wares in item analysis that give a deeper understanding of the contribution and characteristics of each test item to the student or candidates ability on the subject being measured.

The Basic Education Certificate Examination (BECE) is constructed, administered, and scored under the supervision of the Katsina State Education Resource Centre (KSERC). The 2019 BECE in mathematics consists of two sections (A &B). Section A is the 60 multiple-choice items with four (a, b, c, & d) options format and is dichotomously scored, with one mark for each item. The second section B is the essay type where the candidate is expected to answer all the questions. The 60 items that constituted the BECE in Mathematics have 15 items each covering the content of the four (Algebra, Geometry, Trigonometry and Statistics) Mathematics concepts taught in JSS General Mathematics. It is time-restricted within 2 hours candidate is expected to answer all the questions. The BECE items are usually constructed by a team of five subject specialists from each zone to ensure the content validity of the items that constituted the BECE. A moderatos team under the supervision of the Director Examination KSERC is usually set up to select the items for final inclusion into the BECE. Another sub-committee in charge of vetting scores of all marked scripts is also constituted before the final result is approved by the management of KSERC. The scripts are usually marked by the subjects' teachers on invitation and attendance to a 5-day marking orientation organized by the KSERC. To ensure marking is free of bias, inter-zonal script marking is adopted.

Although, Item difficulty "**b**" could be referred to as the proportion of people who get a particular item correct or endorsed an item (if there is no correct response). It is often thought up as an item's easiness because it is based on the number correct/endorsed. It follows that an easy test is made up of easy items and a difficult test is one made up of hard items (Wu & Adams, 2007). This simple premise becomes a bit more complicated as soon as we consider that difficulty is a relative matter. How difficult a test item depends not only on its intrinsic simplicity or accessibility but also on the ability "θ" level of the test taker. Item difficulty "**b**" as an independent variable is related to the dependent variable (candidate ability "θ" level). At $\theta = $ **b,** the candidate has 0.5 chances of endorsing an item correct. However, when $\theta > $ **b,** the candidate has 0.5 (50%) above the chances of answering an item correctly**.** Similarly when $\theta < $ **b,** the candidates have a below 50% chance of answering an item correctly. The range from the

estimate of mean ability index as used in the study refers to the maximum and minimum ability "θ" level of the test taker or candidate required to endorse an item in a multiple choice test correct or wrong. For instance, if the range from the estimate of mean ability is **-1.28 to 1.74** on item 14**,** it could be illustrated using Item Characteristic Curve (ICC) graph from Winsteps as shown in Figures 1a and 1b below.
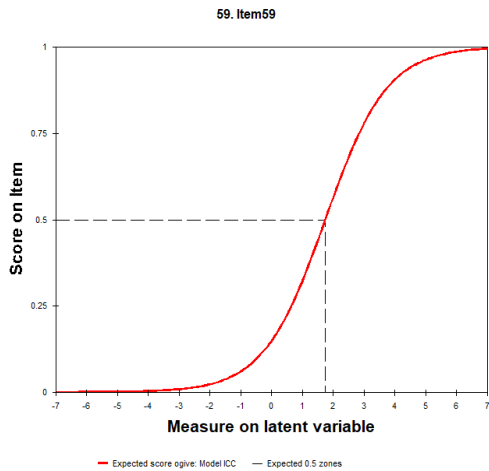
Figure 1a: Graph of ICC with Parameter b = 1.74 logits.

From Figure 1a above, candidates with a higher ability level than b = 1.74 logits have more than a 50% chance of responding with the correct answer.
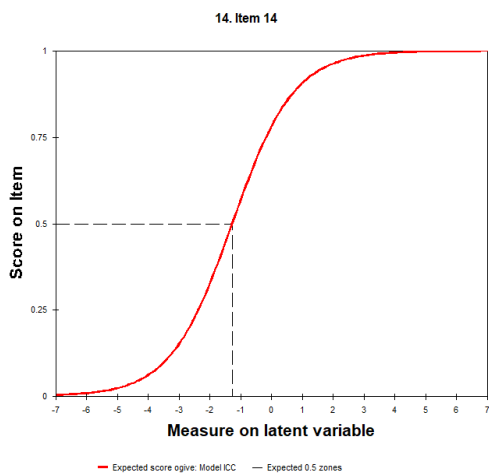
Figure 1b: Graph of ICC with parameter b = -1.28 logit on item 14.

From Figure 1b above, candidates with a lower ability level than b = -1.28 logits have less than a 50% chance of responding with the correct answer. However, the candidate with the ability "θ" below the minimum range (-1.28) implies such a candidate could only endorse the wrong option

on item 14 and the maximum range of ability "θ" to endorse the item14 correctly is 1.74.

A distractor is a wrong option in the multiple–choice question (Sharma, 2021). Hartati and Yogi (2019) affirmed that "on multiple choice test items, the incorrect alternatives are referred to as distractors because they serve to "distract" examinee who does not know the correct response. in CTT distractors are classified into functional and non –functional. Sue (2021) opinioned that a non–functional distractor in an item is the option other than the correct option selected by less than 5% of the candidates and functional is the option selected by 5% or more of the candidates. The percentage of a distractor in CTT could be easily computed manually using the formula PD% = (Number of distractors X100) ÷ Total number of the examinee.

Available literature documented on analysis of item test distractors focused on the effectiveness of item test distractors; characteristics of a good distractor; distractor efficacy; functional and non-functional distractors; Impact of a distractor; and chances of candidates guessing the correct answer(Hartati and Yogi, 2019; Sue, 2021; Sharma, 2021; Burud et al., 2019; Yusuf,2021). These are acknowledged. However, gab on unanswered questions exists from the available literature reviewed. For instant why do less than 5% of the candidates select options other than the correct option while 5% or more of the candidates select the correct option? What is the minimum or maximum ability needed for a candidate to endorse the correct or wrong option? Are the test items proportionally distributed based on the mean ability index of each item distractor? Which item or items need to be reversed, improve or discarded and why? Answers to these questions could not be provided by the CTT approach to the analysis of distractors. However, with the modern IRT soft wares that could handle large data and provide more details on each test item there, answers are likely probable. Given this, the study determined the estimates of item distractor mean ability index of KTS 2019 BECE in mathematics. Specifically, the study determined items with

 i.   A maximum number of candidates who endorsed correct/wrong options and the corresponding estimate of the mean ability index.
 ii. A minimum number of candidates who endorsed correct/wrong options and the corresponding estimate of the mean ability index.
 iii. .Items with the same estimate of mean ability index for endorsing correct and wrong options
 iv. Items with a different estimate of mean ability index for endorsing correct and wrong options

The study was guided by the following research questions:-

 i.   What is the estimate of the mean ability index of the item with a maximum number of candidates who endorsed correct options?
 ii.   What is the estimate of the mean ability index of the item with a maximum number of candidates who endorsed correct options?
 iii. What items have the same estimate of mean ability index for endorsing correct and wrong options?
 iv.   What items have a different estimate of mean ability for endorsing correct and wrong

options?

Methodology

An Ex-post facto design was used for the study because the independent (distracter estimate of mean ability) variable had already occurred and could not be manipulated. Kerlinger (as cited in Cohen et al., 2007) defined ex-post facto as an in which the independent variables have already occurred and in which the researcher starts with the observation of a dependent variable or variables.

The population of the study consist of all 65,773 (40,804 males and 24,969 females) candidates that sat for the 2019/2020 academic session BECE in Mathematics whose Mean $_{age}$ stood at 14 years (KSERC, 2019). The population was characterized by students from three categories of JSS (Day, Boarding and Community) types distributed within the schools in each of the 12 Education Zones of the State. Multi-stage (random; proportionate stratify) sampling techniques were used. For the initial stage, Computer-generated random numbers were used to select six out of the twelve zones. The six sample zones had a population of 42,674 (26003 Male; 16671 Females) 2019 BECE students in mathematics.

Table1: Sample Population of 2019 BECE Students in Mathematics from the Six Zones

Zone	Baure	Faskari	Funtua	Katsina	M/Fashi	Safana	Total
Male	2264	2452	4704	9400	5280	1903	26003
Female	1274	1379	4687	5287	2970	1074	16671
Total	3538	3841	9391	14687	8250	2977	42674

Table 1 above, shows the Sample Population of 2019 BECE Students in Mathematics from the six zones

A proportionate stratified random sampling technique was used in the second stage to select the sample of 500 students as shown in Table 2 below

Table 2: Distribution of the Sample used for the Study

Zone	Baure	Faskari	Funtua	Katsina	M/Fashi	Safana	Total
Male	26	29	70	110	62	22	319
Female	15	16	40	62	35	13	181
Total	41	45	110	172	97	35	500

From Table 2 above 500 (319 males and181 females) students is a sample with the Katsina zone having the highest (172) number of sample students.

While the last stage involved the selection of the top 75% and bottom 25% of the 500 candidates' scores which constituted the total of 334 high and low achievers used in the study.

The data for the study was 60 multiple choice items on Section A obtained from the BECE in mathematics 2019/2020 Academic session marked scripts conducted by KSERC. The data were obtained with a written introduction and permission from the Katsina State Ministry of

Education at the request of the researcher. The researchers strived to avoid bias, in data entry, analysis, and interpretation of data results.

The estimates from the study (maximum and minimum candidates for endorsing correct and wrong options, mean ability index) were generated and analyzed using WINSTEPS version 4.8.2.0 software and Spreadsheet excel.

Results

Table 3: Showing in Percentages Maximum and a minimum number of candidates who endorsed correct and wrong options with corresponding estimates of mean ability index.

Data Count	Correct Option	Wrong Option
Item 4	291	43
Percentage	87	13
Mean Ability	-4.27	-4.96
Item 59	128	205
Percentage	38	62
Mean Ability	-3.40	-4.96

Table 3 shows the percentages of candidates who endorsed correct and wrong options with corresponding estimates of the mean ability index.

Table 4: Items with the Same Estimate of Mean Ability Index for Endorsing Correct and Wrong options

Item	Correct Option	Wrong Option	Item	Correct Option	Wrong Option
3	-3.77	-5.09	4	-4.27	-4.96
47	-3.77	-5.19	22	-4.27	-4.59
6	-3.69	-5.41	29	-3.76	-5.29
23	-3.69	-5.29	35	-3.76	-5.13
8	-3.69	-5.40	13	-4.30	-4.62
43	-3.69	-5.17	17	-4.30	-4.60
9	-3.70	-5.35	16	-4.29	-4.83
48	-3.70	-5.18	22	-4.29	-4.59
10	-3.83	-5.19	30	-4.15	-5.12
25	-3.83	-5.19	47	-4.15	-4.84
60	-3.62	-5.27	36	-3.59	-5.29
21	-3.62	-5.16	41	-3.59	-5.16
5	-4.24	-5.09	44	-3.66	-5.20
32	-4.24	-4.87	46	-3.66	-5.18
52	-4.24	-4.79	56	-3.66	-5.14
11	-4.28	-4.88			
18	-4.28	-4.74			
24	-4.28	-4.74			

Table 4 above shows the items with the same estimates of the mean ability index for endorsing

correct and wrong options**.**

Table 5: Items with Different Estimates of Mean Ability Index for Endorsing Correct and Wrong options

Item	Correct Option	Wrong Option	Item	Correct Option	Wrong Option
1	-4.17	-5.52	39	-3.64	-4.76
2	-3.75	-5.42	40	-4.21	-4.83
7	-3.58	-3.20	41	-4.17	-5.16
13	-4.26	-4.88	42	-4.18	-4.84
14	-4.20	-5.20	45	-4.19	-4.85
19	-4.25	-4.89	50	-3.78	-5.25
26	-4.18	-5.06	51	-3.89	-5.14
27	-3.58	-5.29	53	-4.23	-4.97
28	-3.68	-5.45	54	-3.18	-5.12
31	-3.81	-5.31	55	-3.64	-5.18
33	-3.72	-5.31	57	-3.42	-4.98
34	-3.51	-5.26	58	-3.57	-5.19
37	-4.17	-4.90	59	-3.40	-4.96
38	-3.60	-4.80			

The result in Table 5 above shows the items with different estimates of the mean ability index for endorsing correct and wrong options.

Findings

- The maximum number of candidates that endorsed the correct option is 291(87%) and the wrong option is 43(13%) which corresponds to item 4.
- The estimates of the mean ability index for the item with a maximum number of candidates who endorsed correct and wrong options are -4.27 and -4.96.
- The minimum number of candidates that endorsed correctly is 128(38%) and the wrong options are 205 (62%) which corresponds to item 59.
- The estimates of the mean ability index for the item with a minimum number of candidates who endorsed correct and wrong options are -3.40 and -4.96.
- 24 (40%) of two items each and 9 (15%) of three items each have the same mean ability index for endorsing correct and wrong options whose ranges vary from -3.67 to -4,28 and -4.60 to – 5.40.
- 27(45%) of the items have different or unique estimates of the mean ability index for endorsing the correct option that ranging from -4.25 to -3.8 while the range for endorsing the wrong option is -5.52 to 3.20.

Discussion

The discussion focus on the analysis of data based on estimates of the mean ability index of item

distracters (C- parameter) of Katsina State 2019 BECE in mathematics obtained from 334 (High achievers = 167; and low achievers = 167) candidates. The limitation of the study on estimates of mean ability index based on gender differences among the subject of the study must be acknowledged.

To determine the estimates of the mean ability index of the item with a maximum number of candidates who endorsed correct and wrong options among the high and low achiever candidates, the research question i was answered and the result was tabulated in Table 14.3 of Win steps print out. The summary of the printout was given in Appendix 1. The result in Appendix 1 was summarized in Table 3. From the result in Table 3, item 4 has 291 (87%) the maximum number of candidates who endorsed the correct option with estimates of mean ability index = -4.27 while the corresponding number of candidates who endorsed the wrong option is 43 (13%) whose estimates of mean ability index is -4.96. Finding from this revealed the maximum number of candidates that endorsed the correct option is 291(87%) and the wrong option is 43(13%) which corresponds to item 4. Also, the estimates of the mean ability index for the item with a maximum number of candidates who endorsed correct and wrong options are -4.27 and -4.96.

The result in Table 3 also, shows an answer to research question ii which was summarized from the Win steps printout in Table 14.3 given in Appendix I. From the result in Table 3, the estimates of the mean ability index for item with a minimum number of candidates who endorsed correct and wrong options is -3.40 and -4.96 and this corresponds to item 59 where 128 (38%) endorsed correct option while 205 (62%) endorsed the wrong option. Finding from this revealed that the minimum number of candidates that endorsed correctly is 128(38%) and the wrong options are 205 (62%) which corresponds to item 59. Also, the estimates of the mean ability index for the item with a minimum number of candidates who endorsed correct and wrong options are -3.40 and -4.96. Further analysis of the result in Table A revealed that item 49 was difficult as candidates must have an estimate of the mean ability index of -3.40 to get the item correct while item 4 was easier as candidates need an estimate of the mean ability index of -4.27 which is below -3.40 by -0.87 to get item 4 correct. Sonone et al., (2019) in their study of determining the efficiency of distractors using 80 (high and low achievers) candidates using 50 multiple choice items observed that only 4 candidates endorsed the wrong option while the remaining candidates endorsed the correct option. a similar study carried out by Hartati and Yoge (2019) using 36 high and low achiever candidates reports that only 7 candidates endorsed the wrong option. However, both studies (Sonone; Hartati and Yogi) were silent on the items of the test and item relation with the estimates of the mean ability needed to endorse correct or wrong option.

To achieve objective iii of the study, research question iii was answered and the result is shown in Table 4 which is the summary from the Win steps printout given in Table14.3 given in Appendix1. From the result in Table 4, 24 (40%) of two items each, and nine (15%) of three items each have the same estimates of mean ability index for endorsing correct option that range from -3.67 to -4,28 while the estimates of mean ability index for endorsing the wrong option range from -5.52 to -3.20. Finding from this revealed that 24 (40%) of two items each and 9

(15%) of three items each have the same mean ability index for endorsing correct and wrong options whose ranges vary from -3.67 to -4,28 and -4.60 to – 5.40.

To determine the items with different or unique estimates of mean ability index for endorsing correct and wrong options, research question v was answered. The result for answering the research question v was summarized in Table 5 from the Win steps printout given in Table 14.3 which was given in Appendix 1 . From the result in Table 5, 27 (45%) of the items have different or unique estimates of mean ability index for endorsing correct and wrong options that range from -4.25 to -3. 18 for the correct option and -5.52 to – 3.18 for the wrong option. Finding from this revealed that 27(45%) of the items have different or unique estimates of the mean ability index for endorsing the correct option that ranges from -4.25 to -3.8 while the range for endorsing the wrong option is -5.52 to 3.20.

The implication of the Study Findings

The findings from the study, hope to influence future policy for BECE items test construction, especially at the pilot testing stage of the test items. From the study findings, it was evident that the distribution of Katsina State 2019 BECE items in Mathematics constructed from various topics involved in the JSS mathematics scheme was evenly distributed to cater for various candidates' abilities in mathematics. However, the findings on the percentages of items and their corresponding estimates of mean ability index for endorsing to endorsed correct or wrong option is not well balance (40%; 15% and 45%) as the study findings revealed. There is a need for the test item constructors to improve on the items that show 15% of 3 items with triple mean ability to balance the chance for endorsing correct and wrong options to 50% each.

Conclusion

The study determined the estimates of item distractor mean ability index of KTS 2019 BECE in mathematics using the top 75% and bottom 25% of the 500 sample candidates' scores which constituted the total of 334 high and low achievers used in the study. The data for the study was 60 multiple choice items obtained from the marked scripts conducted by KSERC. The estimates from the study were generated and analyzed using WINSTEPS version 4.8.2.0 software and Spreadsheet excel. Findings from the results of the study and implications of the findings were highlighted and discussed .recommendations were made based on the findings of the study.

Recommendations

The study recommends

- The result from pilot testing of the items is to be carefully analyzed so that the chances of endorsing correct or wrong options for triple items are reversed before the final approval of the items.
- A similar study in other BECE subjects examinable by KSERC is to be carried out.
- The use of modern IRT soft wares for item analysis by KSERC.

References

Burud, K., Nagandla, K., & garwal,P. (2019). Impact of distractors in item analysis of multiple choice questions. *International Journal of Research in Medical Sciences, 17*(4), 1136-1139.

Cohen, L., Manion, L., & Morrison, K. (2007). *research methods in education.* (6, Ed.) London & New York: Routledge, Taylor & Francis Group.

Hartati, N.,& Yogi., H.P.S. (2019). Item analysis for a better quality test. *English Language in Focus (ELIF), 2*(1), 59-70.

Katsina State Education Resource Centre [KSERC, 2019] Junior Secondary School (JSSIII) Population. Katsina State Ministry of Education.

Sharma, L. (2021). Analysis of difficulty index, discrimination index and distractor efficiency of multiple choice questions of speech sounds of English. *International Research Journal of MMC(IRJMMC), 2*(1), 15-28. Retrieved March 21st, 2022, from www.mmchetauda.edu.np

Sonone,K.,Rai,P.P.K.,Ingale,P. (2019). Analysis of MCQin BioChemistry-to Increase MCQ Validity. *International Journal of Advanced Research (IJAR), 7*(9), 456-459. doi:https://dx.doi.org/10.21474/IJAR0/9683

Suek, L. (2021). Item analysis of an English Summative test. *Excellence Journal of Language and Culture, 1*(1), 9-18. Retrieved March 17th, 2022, from https://ojs3.unpatti.ac.id/index.php/pejlac

Wu, M., & Adams, R. (2007). *Applying the Rasch model to psycho-social measurement: A practical approach.* Melbourne: Educational Measurement Solutions.

Yusuf, A. (2021, November). Application of item response theory models on the analysis of Katsina State 2019 Basic Education Certificate Examination (BECE) in mathematics. *PhD., second seminar*. Department of Education, Bayero University, Kano- Nigeria:

Appendix 1

Data Count	Correct Option	Wrong Option	Data Count	Correct Option	Wrong Option
Item 1	287	46	Item 15	233	100
Percentage	86	14	Percentage	70	30
Mean Ability	-4.17	-5.52	Mean Ability	-3.93	-5.36
Item 2	212	121	Item 16	288	46
Percentage	64	36	Percentage	86	14
Mean Ability	-3.75	-5.42	Mean Ability	-4.29	-4.83
Item 3	185	149	Item 17	273	60
Percentage	55	45	Percentage	82	18
Mean Ability	-3.77	-5..09	Mean Ability	-4.30	-4.62
Item 4	**291**	**43**	Item 18	275	57
Percentage	**87**	**13**	Percentage	83	17
Mean Ability	**-4.27**	**-4.96**	Mean Ability	-4.28	-4.74
Item 5	285	49	Item 19	273	59
Percentage	85	15	Percentage	82	18
Mean Ability	-4.24	-5.09	Mean Ability	-4.27	-4.89
Item 6	203	46	Item 20	213	121
Percentage	62	14	Percentage	64	36
Mean Ability	-3.69	-5.41	Mean Ability	-3.78	-5.38
Item 7	172	161	Item 21	173	161
Percentage	52	48	Percentage	72	48
Mean Ability	-3.58	-5.20	Mean Ability	-3.62	-5.16
Item 8	201	132	Item 22	263	69
Percentage	60	40	Percentage	79	21
Mean Ability	-3.67	-5.40	Mean Ability	-4.29	-4.59
Item 9	199	13	Item 23	194	140
Percentage	60	40	Percentage	58	42
Mean Ability	-3.70	-5.35	Mean Ability	-3.69	-5.29
Item 10	203	130	Item 24	273	61
Percentage	61	39	Percentage	82	18
Mean Ability	-3.83	-5.19	Mean Ability	-4.28	-4.74
Item 11	287	47	Item 25	202	130
Percentage	86	14	Percentage	61	39
Mean Ability	-4.28	-4.88	Mean Ability	-3.83	-5.19
Item 12	269	62	Item 26	266	68
Percentage	81	19	Percentage	80	20
Mean Ability	-4.30	-4.62	Mean Ability	-4.18	-5.06
Item 13	277	56	Item 27	208	126
Percentage	83	17	Percentage	62	38
Mean Ability	-4.26	-4.88	Mean Ability	-3.80	-5.29

Item 14	281	53	Item 28	206	128
Percentage	84	16	Percentage	62	38
Mean Ability	-4.20	-5.20	Mean Ability	-3.68	-5.45
Item 30	260	74	Item 29	203	131
Percentage	78	22	Percentage	61	39
Mean Ability	-4.15	-5.17	Mean Ability	-3.76	-5.29
Item 31	202	132	Item 46	178	152
Percentage	60	40	Percentage	54	46
Mean Ability	-3.81	-5.20	Mean Ability	-3.66	-5.18
Item 32	271	63	Item 47	195	138
Percentage	81	19	Percentage	59	41
Mean Ability	-4.24	-4.87	Mean Ability	-3.77	-5.19
Item 33	199	134	Item 48	184	149
Percentage	60	40	Percentage	55	45
Mean Ability	-3.72	-5.31	Mean Ability	-3.70	-5..18
Item 34	172	162	Item 49	234	96
Percentage	51	49	Percentage	71	29
Mean Ability	-3.51	-5.26	Mean Ability	-4.15	-4.84
Item 35	188	146	Item 50	192	140
Percentage	56	44	Percentage	58	42
Mean Ability	-3.76	-5.13	Mean Ability	-3.78	-5.15
Item 36	182	150	Item 51	268	124
Percentage	55	45	Percentage	63	37
Mean Ability	-3.59	-5.29	Mean Ability	-3.89	-5.14
Item 37	246	86	Item 52	257	75
Percentage	74	26	Percentage	77	23
Mean Ability	-4.17	-4.90	Mean Ability	-4.24	-4.74
Item 38	175	159	Item 53	272	61
Percentage	52	48	Percentage	82	18
Mean Ability	-3.60	-5.20	Mean Ability	-4.23	-4.92
Item 39	172	162	Item 54	193	140
Percentage	51	49	Percentage	58	42
Mean Ability	-3.64	-5.13	Mean Ability	-3.18	-4.92
Item 40	265	69	Item 55	175	156
Percentage	79	21	Percentage	53	47
Mean Ability	-4.21	-4.93	Mean Ability	-3.64	-5.18
Item 41	170	164	Item 56	175	158
Percentage	51	49	Percentage	53	47
Mean Ability	-3.59	-5.16	Mean Ability	-3.66	-5.14
Item 42	227	107	Item 57	133	200
Percentage	68	32	Percentage	40	60
Mean Ability	-4.18	-4.74	Mean Ability	-3.42	-4.98

Item 43	179	154	Item 58	170	162
Percentage	54	46	Percentage	51	49
Mean Ability	-3.67	-5.19	Mean Ability	-3.57	-5.19
Item 44	181	151	**Item 59**	**128**	**205**
Percentage	55	45	**Percentage**	**38**	**62**
Mean Ability	-3.66	-5.20	**Mean Ability**	**-3.40**	**-4.96**
Item 45	246	85	Item 60	183	150
Percentage	74	26	Percentage	55	45
Mean Ability	-4.19	-4.85	Mean Ability	-3.62	-5.52