CHAPTER IV

RESEARCH FINDING

This chapter explained the research finding. It consisted of the calculation of trying out instrument, the data description, the data analysis, and the data interpretation.

4.1 The Calculation of Trying out Instrument

Trying out instrument is the way to find out the validity and reliability instruments. It helps the writer to know the instrument was good or not. In this research, the writer used the validity and reliability for calculating the item of the test. In addition, the writer used manual formula and SPSS for calculating the item of the test.

4.1.1 The Validity of Trying Out Instrument

The formula of manual calculation is the correlation product moment formula. The formula as follows:

$$r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$$

Table 4.1 The Validity of Trying Out Instrument Using Manual Calculation

The Score of r_{xy}	Valid/ Invalid
1. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$	Valid

$= \frac{20.306-(14)(368)}{\sqrt{\{20.14-(14)^2\}\{20.7574-368^2\}}}$ $= \frac{6120-5152}{\sqrt{\{280-196\}\{151480-135424\}}}$ $= \frac{968}{\sqrt{\{84.16056\}}}$ $= \frac{968}{\sqrt{1348704}} = \frac{968}{1161,33}$ = 0,833	
2. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.323-(16)(368)}{\sqrt{\{20.16-(16)^2\}\{20.7574-368^2}}$ $= \frac{6460-5888}{\sqrt{\{320-256\}\{151480-135424\}}}$ $= \frac{572}{\sqrt{\{64.16056\}}}$ $= \frac{572}{\sqrt{1027584}} = \frac{572}{1013,69}$ = 0,564	Valid
3. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.277-(13)(368)}{\sqrt{\{20.13-(13)^2\}\{20.7574-368^2\}}}$ $= \frac{5540-4784}{\sqrt{\{260-169\}\{151480-135424\}}}$ $= \frac{756}{\sqrt{\{91.16056\}}}$ $= \frac{756}{\sqrt{1461096}} = \frac{756}{1208,75}$ = 0,625	Valid
4. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.322-(15)(368)}{\sqrt{\{20.15-(15)^2\}\{20.7574-368^2\}}}$ $= \frac{6440-5520}{\sqrt{\{300-225\}\{151480-135424\}}}$	Valid

$= \frac{920}{\sqrt{\{75.16056\}}}$ $= \frac{920}{\sqrt{1204200}} = \frac{920}{1097,36}$ = 0,838	
5. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.121-(6)(368)}{\sqrt{\{20.6-(6)^2\}\{20.7574-368^2\}}}$ $= \frac{2420-2208}{\sqrt{\{120-36\}\{151480-135424\}}}$ $= \frac{212}{\sqrt{\{84.16056\}}}$ $= \frac{212}{\sqrt{1348704}} = \frac{212}{1161,33}$ = 0,182	Invalid
6. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.178-(11)(368)}{\sqrt{\{20.11-(11)^2\}\{20.7574-368^2\}}}$ $= \frac{3560-4048}{\sqrt{\{220-121\}\{151480-135424\}}}$ $= \frac{-488}{\sqrt{\{99.16056\}}}$ $= \frac{-488}{\sqrt{1589544}} = \frac{-488}{1260,77}$ = -0,387	Invalid
7. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.261-(12)(368)}{\sqrt{\{20.12-(12)^2\}\{20.7574-368^2\}}}$ $= \frac{5220-4416}{\sqrt{\{240-144\}\{151480-135424\}}}$ $= \frac{804}{\sqrt{\{96.16056\}}}$ $= \frac{804}{\sqrt{1541376}} = \frac{804}{1241,52}$ = 0,647	Valid

8. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.310-(15)(368)}{\sqrt{\{20.15-(15)^2\}\{20.7574-368^2\}}}$ $= \frac{6200-5520}{\sqrt{\{300-225\}\{151480-135424\}}}$ $= \frac{680}{\sqrt{\{75.16056\}}}$ $= \frac{680}{\sqrt{1204200}} = \frac{680}{1097{,}36}$ = 0,619	Valid
9. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.112-(5)(368)}{\sqrt{\{20.5-(5)^2\}\{20.7574-368^2\}}}$ $= \frac{2240-1840}{\sqrt{\{100-25\}\{151480-135424\}}}$ $= \frac{400}{\sqrt{\{75.16056\}}}$ $= \frac{400}{\sqrt{1204200}} = \frac{400}{1097{,}36}$ = 0,364	Invalid
10. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.63-(3)(368)}{\sqrt{\{20.3-(3)^2\}\{20.7574-368^2\}}}$ $= \frac{1260-1104}{\sqrt{\{60-9\}\{151480-135424\}}}$ $= \frac{156}{\sqrt{\{51.16056\}}}$ $= \frac{156}{\sqrt{818856}} = \frac{156}{904{,}90}$ = 0,172	Invalid
11. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$	Invalid

$= \frac{20.90-(4)(368)}{\sqrt{\{20.4-(4)^2\}\{20.7574-368^2\}}}$ $= \frac{1800-1472}{\sqrt{\{80-16\}\{151480-135424\}}}$ $= \frac{328}{\sqrt{\{64.16056\}}}$ $= \frac{328}{\sqrt{1027584}} = \frac{328}{1013,69}$ = 0,323	
12. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.268-(13)(368)}{\sqrt{\{20.13-(13)^2\}\{20.7574-368^2\}}}$ $= \frac{5360-4784}{\sqrt{\{260-169\}\{151480-135424\}}}$ $= \frac{576}{\sqrt{\{91.16056\}}}$ $= \frac{576}{\sqrt{1461096}} = \frac{576}{1208,75}$ = 0,476	Valid
13. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.55-(3)(368)}{\sqrt{\{20.3-(3)^2\}\{20.7574-368^2\}}}$ $= \frac{1100-1104}{\sqrt{\{60-9\}\{151480-135424\}}}$ $= \frac{-4}{\sqrt{\{51.16056\}}}$ $= \frac{-4}{\sqrt{818856}} = \frac{-4}{904,90}$ = -0,004	Invalid
14. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.256-(13)(368)}{\sqrt{\{20.13-(13)^2\}\{20.7574-368^2\}}}$ $= \frac{5120-4784}{\sqrt{\{260-169\}\{151480-135424\}}}$	Invalid

$= \frac{336}{\sqrt{\{91.16056\}}}$ $= \frac{336}{\sqrt{1461096}} = \frac{336}{1208,75}$ = 0,277	
15. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.51-(3)(368)}{\sqrt{\{20.3-(3)^2\}\{20.7574-368^2\}}}$ $= \frac{1020-1104}{\sqrt{\{60-9\}\{151480-135424\}}}$ $= \frac{-84}{\sqrt{\{51.16056\}}}$ $= \frac{-84}{\sqrt{818856}} = \frac{-84}{904,90}$ = - 0, 092	Invalid
16. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.198-(10)(368)}{\sqrt{\{20.10-(10)^2\}\{20.7574-368^2\}}}$ $= \frac{3960-3680}{\sqrt{\{200-100\}\{151480-135424\}}}$ $= \frac{280}{\sqrt{\{100.16056\}}}$ $= \frac{280}{\sqrt{1605600}} = \frac{280}{1267,12}$ = 0,220	Invalid
17. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.140-(6)(368)}{\sqrt{\{20.6-(6)^2\}\{20.7574-368^2\}}}$ $= \frac{2800-2208}{\sqrt{\{120-36\}\{151480-135424\}}}$ $= \frac{592}{\sqrt{\{84.16056\}}}$	Valid

$= \frac{592}{\sqrt{1348704}} = \frac{592}{1161,33}$ = 0,509	
18. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.30-(2)(368)}{\sqrt{\{20.2-(2)^2\}\{20.7574-368^2\}}}$ $= \frac{600-736}{\sqrt{\{40-4\}\{151480-135424\}}}$ $= \frac{-136}{\sqrt{\{36.16056\}}}$ $= \frac{-136}{\sqrt{578016}} = \frac{-136}{760,27}$ = - 0,178	Invalid
19. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.275-(13)(368)}{\sqrt{\{20.13-(13)^2\}\{20.7574-368^2\}}}$ $= \frac{5500-4784}{\sqrt{\{260-169\}\{151480-135424\}}}$ $= \frac{716}{\sqrt{\{91.16056\}}}$ $= \frac{716}{\sqrt{1461096}} = \frac{716}{1208,75}$ = 0,592	Valid
20. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.287-(14)(368)}{\sqrt{\{20.14-(14)^2\}\{20.7574-368^2}}$ $= \frac{5740-5152}{\sqrt{\{280-196\}\{151480-135424\}}}$ $= \frac{588}{\sqrt{\{84.16056\}}}$ $= \frac{588}{\sqrt{1348704}} = \frac{588}{1161,33}$ = 0,506	Valid

21. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.77-(4)(368)}{\sqrt{\{20.4-(4)^2\}\{20.7574-368^2\}}}$ $= \frac{1540-1472}{\sqrt{\{80-16\}\{151480-135424\}}}$ $= \frac{68}{\sqrt{\{64.16056\}}}$ $= \frac{68}{\sqrt{1027584}} = \frac{68}{1013,69}$ = 0,067	Invalid
22. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.275-(13)(368)}{\sqrt{\{20.13-(13)^2\}\{20.7574-368^2\}}}$ $= \frac{5500-4784}{\sqrt{\{260-169\}\{151480-135424\}}}$ $= \frac{716}{\sqrt{\{91.16056\}}}$ $= \frac{716}{\sqrt{1461096}} = \frac{716}{1208,75}$ = 0,592	Valid
23. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.310-(14)(368)}{\sqrt{\{20.14-(14)^2\}\{20.7574-368^2\}}}$ $= \frac{6200-5152}{\sqrt{\{280-196\}\{151480-135424\}}}$ $= \frac{1048}{\sqrt{\{84.16056\}}}$ $= \frac{1048}{\sqrt{1348704}} = \frac{1048}{1161,33}$ = 0,902	Valid
24. r_{xy} $= \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$	Valid

$= \frac{20.231-(10)(368)}{\sqrt{\{20.10-(10)^2\}\{20.7574-368^2\}}}$ $= \frac{4620-3680}{\sqrt{\{200-100\}\{151480-135424\}}}$ $= \frac{940}{\sqrt{\{100.16056\}}}$ $= \frac{940}{\sqrt{1605600}} = \frac{940}{1267,12}$ = 0,741	
25. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.81-(4)(368)}{\sqrt{\{20.4-(4)^2\}\{20.7574-368^2\}}}$ $= \frac{1620-1472}{\sqrt{\{80-16\}\{151480-135424\}}}$ $= \frac{148}{\sqrt{\{64.16056\}}}$ $= \frac{148}{\sqrt{1027584}} = \frac{148}{1013,69}$ = 0,146	Valid
26. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.237-(11)(368)}{\sqrt{\{20.11-(11)^2\}\{20.7574-368^2\}}}$ $= \frac{4740-4048}{\sqrt{\{220-121\}\{151480-135424\}}}$ $= \frac{692}{\sqrt{\{99.16056\}}}$ $= \frac{692}{\sqrt{1589544}} = \frac{692}{1260,77}$ = 0,548	Valid
27. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.65-(4)(368)}{\sqrt{\{20.4-(4)^2\}\{20.7574-368^2\}}}$	Invalid

$= \frac{1300 - 1472}{\sqrt{\{80 - 16\}\{151480 - 135424\}}}$ $= \frac{-172}{\sqrt{\{64.16056\}}}$ $= \frac{-172}{\sqrt{1027584}} = \frac{-172}{1013{,}69}$ = - 0,169	
28. $r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$ $= \frac{20.77 - (4)(368)}{\sqrt{\{20.4 - (4)^2\}\{20.7574 - 368^2\}}}$ $= \frac{1540 - 1472}{\sqrt{\{80 - 16\}\{151480 - 135424\}}}$ $= \frac{68}{\sqrt{\{64.16056\}}}$ $= \frac{68}{\sqrt{1027584}} = \frac{68}{1013{,}69}$ = 0,067	Invalid
29. $r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$ $= \frac{20.216 - (11)(368)}{\sqrt{\{20.11 - (11)^2\}\{20.7574 - 368^2\}}}$ $= \frac{4320 - 4048}{\sqrt{\{220 - 121\}\{151480 - 135424\}}}$ $= \frac{272}{\sqrt{\{99.16056\}}}$ $= \frac{272}{\sqrt{1589544}} = \frac{272}{1260{,}77}$ = 0,215	Invalid
30. $r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$ $= \frac{20.251 - (11)(368)}{\sqrt{\{20.11 - (11)^2\}\{20.7574 - 368^2\}}}$ $= \frac{5020 - 4048}{\sqrt{\{220 - 121\}\{151480 - 135424\}}}$	Valid

$= \frac{972}{\sqrt{\{99.16056\}}}$ $= \frac{972}{\sqrt{1589544}} = \frac{972}{1260,77}$ = 0,770	
31. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.285-(13)(368)}{\sqrt{\{20.13-(13)^2\}\{20.7574-368^2\}}}$ $= \frac{5700-4784}{\sqrt{\{260-169\}\{151480-135424\}}}$ $= \frac{916}{\sqrt{\{91.16056\}}}$ $= \frac{916}{\sqrt{1461096}} = \frac{916}{1208,75}$ = 0,757	Valid
32. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.307-(15)(368)}{\sqrt{\{20.15-(15)^2\}\{20.7574-368^2\}}}$ $= \frac{6140-5520}{\sqrt{\{300-225\}\{151480-135424\}}}$ $= \frac{620}{\sqrt{\{75.16056\}}}$ $= \frac{620}{\sqrt{1204200}} = \frac{620}{1094,36}$ = 0,566	Valid
33. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.285-(13)(368)}{\sqrt{\{20.13-(13)^2\}\{20.7574-368^2\}}}$ $= \frac{5700-4784}{\sqrt{\{260-169\}\{151480-135424\}}}$ $= \frac{916}{\sqrt{\{91.16056\}}}$	Valid

$= \frac{916}{\sqrt{1461096}} = \frac{916}{1208{,}75} = 0{,}757$	
34. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.259-(12)(368)}{\sqrt{\{20.12-(12)^2\}\{20.7574-368^2\}}}$ $= \frac{5180-4416}{\sqrt{\{240-144\}\{151480-135424\}}}$ $= \frac{764}{\sqrt{\{96.16056\}}}$ $= \frac{764}{\sqrt{1541376}} = \frac{764}{1241{,}52} = 0{,}615$	Valid
35. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.84-(4)(368)}{\sqrt{\{20.4-(4)^2\}\{20.7574-368^2\}}}$ $= \frac{1680-1472}{\sqrt{\{80-16\}\{151480-135424\}}}$ $= \frac{208}{\sqrt{\{64.16056\}}}$ $= \frac{208}{\sqrt{1027584}} = \frac{208}{1013{,}69} = 0{,}205$	Invalid
36. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.37-(2)(368)}{\sqrt{\{20.2-(2)^2\}\{20.7574-368^2\}}}$ $= \frac{740-736}{\sqrt{\{40-4\}\{151480-135424\}}}$ $= \frac{4}{\sqrt{\{36.16056\}}}$ $= \frac{4}{\sqrt{578016}} = \frac{4}{760{,}27} = 0{,}005$	Invalid

37. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.27-(1)(368)}{\sqrt{\{20.1-(1)^2\}\{20.7574-368^2\}}}$ $= \frac{540-368}{\sqrt{\{20-1\}\{151480-135424\}}}$ $= \frac{172}{\sqrt{\{19.16056\}}}$ $= \frac{172}{\sqrt{305064}} = \frac{172}{552{,}32}$ = 0,311	Invalid
38. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.104-(5)(368)}{\sqrt{\{20.5-(5)^2\}\{20.7574-368^2\}}}$ $= \frac{2080-1840}{\sqrt{\{100-25\}\{151480-135424\}}}$ $= \frac{240}{\sqrt{\{75.16056\}}}$ $= \frac{240}{\sqrt{1204200}} = \frac{240}{1097{,}36}$ = 0,218	Invalid
39. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.48-(3)(368)}{\sqrt{\{20.3-(3)^2\}\{20.7574-368^2\}}}$ $= \frac{960-1104}{\sqrt{\{60-9\}\{151480-135424\}}}$ $= \frac{-144}{\sqrt{\{51.16056\}}}$ $= \frac{-144}{\sqrt{818856}} = \frac{-144}{904{,}90}$ = - 0,159	Invalid

40. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.37-(2)(368)}{\sqrt{\{20.2-(2)^2\}\{20.7574-368^2\}}}$ $= \frac{740-736}{\sqrt{\{40-4\}\{151480-135424\}}}$ $= \frac{4}{\sqrt{\{36.16056\}}}$ $= \frac{4}{\sqrt{578016}} = \frac{4}{760{,}27}$ = 0,005	Invalid
41. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.51-(3)(368)}{\sqrt{\{20.3-(3)^2\}\{20.7574-368^2\}}}$ $= \frac{1020-1104}{\sqrt{\{60-9\}\{151480-135424\}}}$ $= \frac{-84}{\sqrt{\{51.16056\}}}$ $= \frac{-84}{\sqrt{818856}} = \frac{-84}{904{,}90}$ = - 0,092	Invalid
42. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.9-(1)(368)}{\sqrt{\{20.1-(1)^2\}\{20.7574-368^2\}}}$ $= \frac{180-368}{\sqrt{\{20-1\}\{151480-135424\}}}$ $= \frac{-188}{\sqrt{\{19.16056\}}}$ $= \frac{-188}{\sqrt{305064}} = \frac{-188}{552{,}32}$ = - 0,340	Invalid
43. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$	Invalid

$= \frac{20.191-(10)(368)}{\sqrt{\{20.10-(10)^2\}\{20.7574-368^2\}}}$ $= \frac{3820-3680}{\sqrt{\{200-100\}\{151480-135424\}}}$ $= \frac{140}{\sqrt{\{100.16056\}}}$ $= \frac{140}{\sqrt{1605600}} = \frac{140}{1267,12}$ = 0,110	
44. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.67-(4)(368)}{\sqrt{\{20.4-(4)^2\}\{20.7574-368^2\}}}$ $= \frac{1340-1472}{\sqrt{\{80-16\}\{151480-135424\}}}$ $= \frac{-132}{\sqrt{\{64.16056\}}}$ $= \frac{-132}{\sqrt{1027584}} = \frac{-132}{1013,69}$ = - 0,130	Invalid
45. $r_{xy} = \frac{N\sum XY-(\sum X)(\sum Y)}{\sqrt{\{N\sum X^2-(\sum X)^2\}\{N\sum Y^2-(\sum Y)^2\}}}$ $= \frac{20.40-(3)(368)}{\sqrt{\{20.3-(3)^2\}\{20.7574-368^2\}}}$ $= \frac{800-1104}{\sqrt{\{60-9\}\{151480-135424\}}}$ $= \frac{-304}{\sqrt{\{51.16056\}}}$ $= \frac{-304}{\sqrt{818856}} = \frac{-304}{904,90}$ = - 0,335	Invalid

After conducted manual calculation using the correlation product moment, the writer continued the calculation using SPSS formula to find out the validity of items test.

The items test was valid when $r_{xy} > r_{table.}$ The r_{tabel} of this research was 0, 4438. Based on the data above, it showed that there were 19 item tests that the score higher than r_{table} and 26 item tests that the score lower than r_{table}. It means that there were 19 item tests were valid and 26 item tests were invalid. In order to get 20 item tests, the writer revised 1 invalid item test that similar with the valid item test. It was used to make easy in assessing the item test.

4.1.2 The Reliability of Trying Out Instrument

In this research, the writer used kr-21 formula to find out the reliability of the test. It was like the validity above; in this part, the writer used manual calculation and SPSS formula for calculating the reliability of the tests. The formula of kr-21 as follows:

$$r_{11} = \left(\frac{k}{k-1}\right)\left(1 - \frac{k(k-M)}{kV_t}\right)$$

This is the manual calculation of reliability instrument test using kr-21 formula.

k = 45

M $= \frac{\sum x}{N} = \frac{368}{20} = 18{,}4$

Vt = 42, 25

So, the calculation is:

$$r_{11} = \left(\frac{k}{k-1}\right)\left(1 - \frac{M(k-M)}{kV_t}\right)$$

$$r_{11} = \left(\frac{45}{45-1}\right)\left(1 - \frac{18{,}4(45-18{,}4)}{45.\,42{,}25}\right)$$

$$r_{11} = \left(\frac{45}{44}\right)\left(1 - \frac{18{,}4.\,26{,}6}{1901{,}25}\right)$$

$$r_{11} = (1{,}0227)\left(1 - \frac{489{,}44}{1901{,}25}\right)$$

$$r_{11} = (1{,}0227)(1 - 0{,}257)$$

$$r_{11} = (1{,}0227).\,(0{,}743)$$

$$r_{11} = 0{,}759$$

The result of manual calculation in reliability instrument was 0,759. After conducted manual calculation using the kr-21 formula, the writer continued the calculation of reliability using SPSS formula. The calculation described as follows:

Table 4.2. The Reliability of Trying Out Instrument Using SPSS Calculation

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.714	.800	46

Based on the data above, it showed that the reliability of instrument using SPSS formula was 0,714, with N = 20, α = 5% and r_{table} = 0, 4438. The item test was reliable when $r_{11} > r_{table}$. So, the instrument of the test was reliable.

4.2 The Data Description

In this research, the writer collected the data from pre-test and post-test both in experimental and control class. The data description was needed in this research. It showed the students' achievement in experimental and control classes before and after treatment. In this part, the writer divided into the students' pre-test and post-test scores in experimental, the students' pre-test and post-test scores in control class.

4.2.1 The Students' Pre-test and post-test Scores

The pre-test and post-test conducted in experimental and control class. The pre-test was held on March 21th, 2018 and the post-test was held on April 19th, 2018 in class VIII A as experimental class which is consisting of 28 students. Besides that, in control class the pre-test and post-test was held on March 31st, 2018 and May 9th, 2018 in VIII B which consisted of 24 students. The data of pre-test and post-test scores showed as follows:

Table 4.3 The Students' Pre-test and Post-test Scores in Experimental Class

No	Score Pre-test	Score Post-test	Gained Score
1	80	95	15
2	80	95	15
3	55	75	20
4	75	100	25
5	50	100	50
6	70	85	15
7	70	95	25
8	45	90	45
9	50	90	40
10	50	75	25
11	70	95	25
12	60	95	35
13	80	95	15
14	80	95	15
15	55	90	35
16	70	100	30
17	30	95	65
18	80	100	20
19	55	85	30
20	80	100	20
21	60	85	25
22	25	95	70
23	35	70	35
24	70	95	25
25	65	90	25
26	60	90	30
27	60	95	35
28	65	85	20
$\sum$	**1725**	**2555**	**830**
Mean	**61,61**	**91,25**	**29,64**

The table above described that there was improvement between pre-test and post-test in experimental class. It could be seen from the mean score of pre-test 61,61 became 91,25 in post-test. The lowest score of pre-test was 25 and the highest score was 95. Besides that, the lowest score in post-test was 70 and the highest score was 100. It showed that there was improvement in using mistake buster technique in experimental class.

Table 4.4 The Students' Pre-test and Post-test Scores in Control Class

No	Score Pre-test	Score Post-test	Gained Scores
1	35	80	45
2	50	85	35
3	85	90	5
4	15	60	45
5	55	70	15
6	60	85	25
7	85	90	5
8	85	90	5
9	85	65	-20
10	50	75	25
11	45	85	40
12	60	80	20
13	35	85	50
14	80	90	10
15	45	60	15
16	60	85	25
17	40	70	30
18	20	40	20
19	80	70	-10
20	45	55	10
21	50	75	25
22	55	75	20

23	30	85	55
24	85	70	-15
∑	**1335**	**1815**	**480**
Mean	**55,62**	**75,63**	**20,00**

Based on the table above, it showed that the mean score of pre-test in control class was 55,62 became 75,63 in post-test. The lowest score of pre-test in control class was 15 and the highest score in control class was 85. Besides that, the lowest score in post-test was 40 and the highest score was 90. From the both of the data, the writer concludes that there was improvement in using conventional technique in control class, but the result of the pre-test and post-test scores in experimental class was higher than control class.

4.3 The Data Analysis

In this part described some techniques to analyze the data. The data was analyzed using t-test formula to prove statistically whether there is any significant different between students' gained scores in experimental class and control class. The writer used manual calculation to find out t score and continued using SPSS formula.

The formula of t-test as follows:

$$t = \frac{M_X - M_Y}{\sqrt{\left(\frac{\sum x^2 + \sum y^2}{N_x + N_y - 2}\right)\left(\frac{1}{N_x} + \frac{1}{N_y}\right)}}$$

In order to get the calculation of T-test, there are some procedures to be taken in this formula. The procedures as follows:

1. Determining mean of gained score of experiment class:

$$M_x = \frac{\sum X}{N_x} = \frac{830}{28} = 29{,}64$$

2. Determining mean of gained score of control class:

$$M_y = \frac{\sum y}{N_y} = \frac{480}{24} = 20$$

3. Determining deviation of experimental class:

$$\sum x^2 = \sum X^2 - \frac{(\sum X)^2}{N}$$

$$\sum x^2 = 29950 - \frac{(830)^2}{28}$$

$$\sum x^2 = 29950 - \frac{688900}{28}$$

$$\sum x^2 = 29950 - 24603{,}57$$

$$\sum x^2 = 5346{,}43$$

4. Determining deviation of control class:

$$\sum y^2 = \sum Y^2 - \frac{(\sum Y)^2}{N}$$

$$\sum y^2 = 18450 - \frac{(480)^2}{24}$$

$$\sum y^2 = 18450 - \frac{230400}{24}$$

$$\sum y^2 = 18450 - 9600$$

$$\sum y^2 = 8850$$

5. Finding t score using t-test formula:

$$t = \frac{M_x - M_y}{\sqrt{\left(\frac{\sum x^2 + \sum y^2}{N_x + N_y - 2}\right)\left(\frac{1}{N_x} + \frac{1}{N_y}\right)}}$$

$$t = \frac{29{,}64-20}{\sqrt{\left(\frac{5346{,}43+8850}{28+24-2}\right)\left(\frac{1}{28}+\frac{1}{24}\right)}}$$

$$t = \frac{9{,}64}{\sqrt{\left(\frac{14196{,}43}{50}\right)\left(\frac{6}{168}+\frac{7}{168}\right)}}$$

$$t = \frac{9{,}64}{\sqrt{(283{,}92)\ (0{,}077)}}$$

$$t = \frac{9{,}64}{\sqrt{21{,}86}} = \frac{9{,}64}{4{,}67}$$

$$t = 2{,}\ 06$$

6. Determining t-table in significance level of 5% with degree of freedom (df):

   df = (Nx + Ny) -2

   df = (28 + 24) -2

   df = 50

The score of degrees freedom (df) 50 at the degrees significant 5% is 2,009 and the score of $t_{observe}$ is 2,06. So, it could be seen that $t_{observe} > t_{table}$ = 2,06 > 2,009. Besides that, the writer continued the calculation using SPSS formula.

The next calculation is the calculation of gained scores in experimental and control class. It was used to answer the hypothesis of the research. The data of t-test could be seen as follows:

Table 4.5 The T-test of Gained Scores in Experimental Class and Control Class

Group Statistics

Class		N	Mean	Std. Deviation	Std. Error Mean
Gained Scores	Experimental Class	28	29,6429	14,07181	2,65932
	Control Class	24	20,0000	19,61588	4,00407

Independent Sample Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Gained Scores	Equal variances assumes	2,445	,124	2,057	50	,045	9,64286	4,68729	,22816	19,05755
	Equal variances not assumes			2,006	40,974	,051	9,64286	4,80672	-,06470	19,35042

Based on the data above, the first table is group statistics. It showed that the samples of experimental class and control class were difference. The experimental class was 28 students with mean score are 29,64 and the control class was 24 students with the mean score 20. Then the standard deviation each group were 14,07 for experimental class and 19,61 for control class. The next table is independent samples test. It described that the analysis of Levene's Test could be seen that the significant 2 tailed is 0,045. It showed that 0,045 < 0,05, it means that there is significant difference between the post-test score in experimental class and control. Besides that, the score of $t_{observe}$ is 2,057 and the score of t_{table} with degress of freedom 5% and df 50 is 2,009. The $t_{observe} > t_{table}$ = 2,057 > 2,009. It means that Ha was accepted and Ho was rejected.

4.4 The Data Interpretation

This part explained about the data interpretation. It was used to answer the research question about the use of the mistake buster technique in improving students' grammar mastery at eight grade students of SMP Islam Pecangaan. Besides that, it used to prove the hypothesis. It could be prove by using the data gained score in experimental and control class with the calculation using t-test manual or SPSS. The writer proposes the null hypothesis (Ho) and alternative hypothesis (Ha) as follows:

Ho : There is no a significant difference in students' grammar mastery between the students who are taught by using the mistake buster technique and those who are taught by using the conventional technique.

Ha : There is a significant difference in students' grammar mastery between the students who are taught by using the mistake buster technique and those who are taught by using the conventional technique.

The assumption of this hypothesis as follows:

1. If $t_o > t_{table,}$ the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted. It means that there is an effectiveness of mistake buster technique to improve students' grammar mastery.
2. If $t_o < t_{table}$ the null hypothesis (Ho) is accepted and the alternative hypothesis (Ha) is rejected. It means that there is no effectiveness of mistake buster technique to improve students' grammar mastery.

Based on the description of data above, the writer concludes that the score of t_o was 2,057 and the degree of freedom (df) was 50 with significant 5% then the score of t_{table} was 2,009. It showed that t_o higher than t_{table} (2,057 > 2,009). It means that the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted. So, there is an effectiveness of mistake buster technique to improve students' grammar mastery at eight grade students of SMP Islam Pecangaan.