

3

(Research and Development)

1

1

2

1

3

1

1

1

1.

5

1.1

1

1

1.2

1

(

)

1

1.3

1

..

1

1.4

2

1.4.1 . .

(

)

5

142

()
1

2.

1
1 3

2 2552

1

1
2

3
2552

3

3

9
8080 (E₁ E₂)

1

4

1
2
3
4

1

- 1.
- 2.
- 3.
- 4.

4.1
4.2

4.3

44

45

46

4.7

4.8

4.9

4.10

4.11

5.

5.1

. . 2546

5.2

8

5.3

54

5.5

5.6

6.

7.

5

0.60

8.

9.

58

1

1

2

2552

3

8080

(E/E₂)

1

1

2

2552

9

3

3

3

2

1.

$$\bar{X} = \frac{\sum X}{N}$$

\bar{X}

$\sum X$

N

+1

0

-1

050

2.

E₁/E₂ (

2534.101-102)

$$E_1 \equiv \frac{\frac{\sum X_1}{N}}{A} \times 100$$

$$E_2 \equiv \frac{\frac{\sum X_2}{N}}{B} \times 100$$

E₁
E₂
 $\sum X_1$
 $\sum X_2$
A
B
N

8080

80

80

2

1

1

1 22

(Purposive Sampling)

2

2552

(Quasi Experimental)

(One Group Pretest-Posttest

Design) (, 2544 : 62) 2

2

O_1	T	O_2

O_1

T

O_2

1

1

1

22

2

2552

1.

10

2.

30

5

4

2553

3

3

1	1	4-8 53	1. 2. - - -	- (10) - - 5	2.5
2	2	11-15 53	- - - -	- - 5	2.5
3	3	18-22 53	- -	- 5	2.5

			-		
			-		
			-		
4	4	25-29	1.	-	2.5
		53		-	
			-	5	
			-	-	
			-	(
			-		
			-	10)	
			2.		
					10

3.

10

2

1.

4

1

2

		3							
		4							
	2.								
		2.1							
10									
		2.2						5	
		2.3							
	1.								1
		1.1				. .2546			
		1.2							
		1.3							
		1.4							
		1.5							
		5						(IOC)	
			0.6	1					
		1.6							1
								1	
	2	2552		9					
		1.7							
		1.7.1				(P)			
			.42	.75					
		1.7.2				(r)		12	2
						.27	.66		
		1.8							
	2.							5	
		2.1				. .2546			
		2.2							

2.3

2.4

2.5

5

(IOC)

0.06

1

2.6

1

1

2

2552

9

5

2.8

3.

5

13

3.1

..2546

3.2

3.3

3.4

3.5

5

(IOC)

0.06

1

3.6

1

2

2552

22

1

1.

10

65

1.1

4

1

0

1.2

1.3

t-test

dependent

2.

5

2.1

1

0

2.2

2.3

t-test

dependent

3.

5

13

3.1

3

2

1

0

3.2

(\bar{x})

(S.D.)

4

2.26 - 3.00

1.51 - 2.25

0.76 - 1.50

0.00 - 1.75

1.

(Difficulty)

P (.2535 : 90)

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

P

R

N

(Discrimination)

(

.2535 : 87)

$$r = \frac{R_h}{n_1} - \frac{R_l}{n_2}$$

r

h

L

 n_1 n_2

2.

2.1

(.2535 : 102)

$$\bar{X} = \frac{\sum X}{N}$$

 \bar{X} $\sum X$

N

2.2

(

.2535 : 103)

$$S.D. = \sqrt{\frac{N \sum X^2 - (\sum X)^2}{N(N-1)}}$$

S.D.

 $\sum X^2$ $(\sum X^2)$

3. N

t-test

dependent (.2538 : 248)

$$t = \frac{\sum D}{\sqrt{\frac{N \sum D^2 - (\sum D)^2}{(N-1)}}$$

D
N

3

2552 22

1 1 2
(Purposive Sampling)

3

1.

2.

3.

4.

5.

1.

2.

1.

3

2

1

2

 (\bar{X})

(S.D.)

3

2.50 - 3.00

1.50 - 2.49

0.00 - 1.49

1. (.2535 : 102)

$$\bar{X} = \frac{\sum X}{N}$$

 \bar{X} $\sum X$

N

2. (.2535 : 103)

$$S.D. = \sqrt{\frac{N \sum X^2 - (\sum X)^2}{N(N-1)}}$$

S.D.

$$\sum X^2$$

$$(\sum X)^2$$

N