Enhancing Female Students Decision-Making Competency through Problem solving Instructional Model

MOEMEKE, CLARA DUMEBI (Ph.D)[1,] *College of Education, Agbor. Nigeria, E-mail: claramoekphd@yahoo.co.uk*
&
OMOIFO, CHRISTY NKECHI (PROF.), University of Benin, Benin city, Nigeria, E-mail: cnomoifo@yaho

Abstract

•Design = Quasi-experimental, involving pre and posttests.
• Dependent variable = was students' scores in decision-making test
• independent variables = the instructional models and sex.
•Population = 250 males and 230 females.
•Treatment = The experimental (PSH model) Control (expository model) for twelve weeks.
•Analysis technique = multiple regression, means and t-test.
•Result = Experimental group differed significantly [95,487(2, 479)= 95.487, p<0.05] in decision-making from the control group with a Beta value of .501 hence contributed more to the students' score on decision-making than sex (β = .140).
•Females benefitted more [t=4.429(2, 238)] from the PSH (Mean = 66.52; SD = 6.552) than males (mean =62.22; SD =8.433).

Introduction

Nigeria is a country with great human, natural and materials potentials.

•About half of the population consists of women.

•is in a search for individuals and ways to utilize her endowment to solve problems of poverty, unemployment, disease, corruption, insecurity and insurgence.

•There has been poor presence of females in decision-making positions due to certain barriers.

•Studies (Arijesuyi & Olufemi, 2012; Orasanu & Connelly, 1993) reported difference in the level, type of and severity of decision-making in males and females.

•This study investigates male and female science students' decision-making competence development after exposure to STS curriculum using the PSH instructional model.

Statement of the Problem

The classroom is the hub for fostering important national objectives and achieving goals.

• Secondary school students are at the threshold of making life decisions.

• Teaching science effectively at this level with instructional models that encourage the acquisition of decision-making correlate positively with success in life (Jacobson, et al., 2012; Bruine de Bruin et al., 2007; Fischhoff, 2008).

Research Hypotheses

•There is no significant effect of implementing STS curriculum using the PSH instructional model on students' decision- making competence.

•There is no significant difference in male and female students' decision making competence after an STS course using the PSH instructional model.

Design of the Study

❖Design : Quasi-experimental non randomized control group (pre and posttests).

❖dependent variable: Students' scores in decision-making test

❖independent variables: instructional models (Problem solving heuristics PSH and expository models) and sex.

Method of the Study

Population: 480 students consisting of 250 males (112 experimental and 138 in control group) and 230 females (128 i experimental and 102 in control group) .

Treatment : Experimental = PSH instructional model

control = expository instructional model

Duration = Twelve weeks (Two hours per week).

Pretest was administered to all groups

Teaching package: Experimental group was presented with some science related everyday issues on combustion, pollution, predation, vaccination, diseases, health and living, climate change, food production and preservation, energy production, conversion and use; population and control, family planning and abortion, terrorism and mass destruction, and bio modification of foods.

Students were encouraged to generate some useful suggestions for resolving problems associated with these issues.

Instrument : Decision-making test (DMAT) (Umoren, 1991)

Result

A summary of the result of the regression analysis is presented in Tables 1 and 2 below.

Table 1: ANOVA from regression summary of effect of treatment and sex on students' development of decision-making competency.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8877.967	2	4438.983	95.487	.000[b]
	Residual	22174.681	477	46.488		
	Total	31052.648	479			

a. Dependent Variable: Posttest Score
b. Predictors: (Constant), sex, treatment

Table 2 : Coefficients of treatment and sex on students' Decision-making competence development

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Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	69.112	1.424		48.545	.000
	Treatment	-8.060	.626	-.501	-12.873	.000
	Sex	2.257	.627	.140	3.601	.000

a. Dependent Variable: Posttest Score

ANOVA from the regression analysis

Experimental group differed significantly

[F (2, 477) = 95.487, p<.05) with R^2 of .286 in the Decision – making competence from the control group.

Beta value of .501 . Treatment contributed more to the students' score on decision making than sex (β = .140).

This implies that the PSH produced a stronger effect on the subjects' decision-making development than sex.

The null hypothesis 1 which states that there is no significant effect of implementing STS curriculum using the PSH instructional model on students' decision-making competence was rejected.

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Means, SD and t-test summaries based on sex

Table 3 : mean and standard deviation of male and female students' performance in decision- making test

Sex		N	Mean	Std. Deviation	Std. Error Mean
Posttest Score	Male	112	62.22	8.433	.797
	Female	128	66.52	6.557	.580

t-test of significance of the difference in male and female students' performance in decision-making at posttest.

Table 4 : t-test of significance of the difference in male and female students' performance in decision-making at posttest.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Posttest Score	Equal variances assumed	10.290	.002	-4.429	238	.000	-4.292	.969	-6.202	-2.383
	Equal variances not assumed			-4.356	208.503	.000	-4.292	.985	-6.235	-2.350

Conclusion

t-value (t=4.429 (2, 238) for PSH has higher mean and SD

(66,52, SD= 6.552) > (Mean=62.22, SD = 8.43) for the expository model. Females made higher gains in decision-making than males

Recommendation/implication for policy

❖PSH is gender friendly and supports the acquisition of decision–making competencies in both sexes. It should be used in science teaching to enhance gender equity and better science learning outcome

❖Use of exposition should be minimized in science teaching.

❖Train teachers on the use of PSH in science teaching.

References

Arijesuyo, A. E & Olufemi, A. S (2012) Gender Undertone in Occupational Competence of University Workers. An Application of Holand's Theory (1959) *Mediterranean journal of Social sciences,* 3(3) 271-276 Doi: 10.5901/mjss.2012.v3n3p271

Bruine de Bruin W, Parker A, Fischhoff, B (2007) Individual differences in adult decision-making competence (A-DMC). *Journal of Personality and Social Psychology* 92: 938–956

Fischhoff, B (2008) Assessing adolescent decision-making competence. *Developmental Review* 28: 12–28.

Jacobson D., Parker A., Spetzler C., Bruine de Bruin W., Hollenbeck K., Heckerman, D & Fischhoff, B. (2012) Improved Learning in U.S. History and Decision Competence with Decision-Focused Curriculum. PLoS ONE 7(9): e45775. doi:10.1371/journal.pone.0045775

Orasanu, J & Connolly, T (1993) The reinvention of decision making. In Klein, G; Orasanu, J; Calderwood, G &Zsambok, C. E (eds) Decision making: models and methods (p 3-20) Norwood NJ: Ablex

Umoren, G.U. (1991). A science Technology –Society paradigm and cross River state secondary school students' scientific literacy, problem solving and precision making. An unpublished PhD thesis submitted to faculty of Education, university of Ibadan, Nigeria.