

THE EFFECT OF HEURISTIC TEACHING METHODOLOGY ON SELF ESTEEM AND COPING TO STRESS AMONG UNIVERSITY STUDENTS

Sidra Farooq Butt and Zainab Fatawwat Zadeh
Institute of Professional Psychology, Bahria University Karachi Campus,

ABSTRACT

Objective: The purpose of the present study was to investigate the relationship between Heuristic teaching methodology and its effectiveness in improving self-esteem and coping responses to stress of university students.

Design: An experimental research design

Place and Duration of the study: Jan 2017 to dec 2017 ,Bahria University Karachi Campus.

Subjects and Method: A sample of 90 students of fourth semester in management science department of Bahria University Karachi Campus was taken through convenient sampling. 45 students were in experimental and 45 students were in control group. The age ranges of participants were between 18-25 years ($M=20.3$; $SD=1.27$). For this purpose a heuristic teaching method intervention was developed. A pre and posttest design was used to assess effect on self-esteem and coping responses of students. An intervention was employed in 12 sessions within 4 four months of a regular semester. Its results were compared to the class which was taught traditionally.

Results and Conclusion : The results show that there was a significant difference in the self-esteem in the pre and post-test of students in the heuristic teaching method. Similarly there is a significant difference in the coping styles except for avoidance coping after using heuristic teaching as compared to pre intervention. A significant difference was noted in heuristic teaching group as compared to the traditional teaching in the self-esteem and coping styles except for the avoidance coping and social diversion coping group. The results of the present study could be useful for increasing self-esteem and coping responses in university students and for future references.

Keywords: Heuristic Teaching; Self Esteem; Stress; Coping Responses

INTRODUCTION

Heuristic Teaching Strategy is the method where the student is a discoverer and is responsible for finding out or inquires about the topic being learnt or taught instead of only receiving teacher's explanation or demonstration (Nickerson, Perkins, & Smith, 2014). It helps students learn by reasoning and analyzing (Snyder & Snyder, 2008). In other words, heuristic teaching approach principally engrosses and motivates the students to use an active process of inquiry and discovery so as to assist them in the development and progression of the conducts and habits of any specific discipline or a field of learning. Traditional teaching, on the other hand, is a method where teacher being the controller of the learning environment. Power and responsibility are held by the teacher and they play the role of an instructor and decision making in regard to curriculum content and specific outcomes (Novak, Patterson, Gavrin, & Enger, 1998)

Many supporters of Heuristic approach believed that the students could be effectively trained to discover the systematic and scientific ideas by using their cognitive processes and faculties of introspection and observation, reasoning, and memory (Deboer, 2006). Armstrong (1910) brought the Heuristic approach by pointing it out as the most effective method of teaching, which places the students as a discoverer in the field of learning (Rayner-Canham, 2014). It also helps the students to develop a thorough understanding of the subject content in an expressive and meaningful way and also helps them in maintaining good concentration and attention and gives them a lesser chance of forgetting which, in turn, helps in developing self-assurance, confidence, and good self-control in the students. This teaching or learning methodology builds self-reliance and confidence in the students, increasing their self-esteem and coping strategies as well. However, the teacher requires a lot of preparation and planning to teach with the heuristic attitude (Deboer, 2006).

It has been emphasized that Heuristic strategies should be the focus of teaching, but there have been a lot of difficulties faced to change the traditional ways of teaching in to the Heuristic approach (Arends, 2014). Various arguments have been done about the effectiveness and usefulness of these traditional strategies (Hand, Norton-Meier, Gunel, & Akkus, 2016). Study findings showed the teaching style influenced the level of aspiration. Baig (2015) highlighted that deductive, inductive, lecture, discovery, or heuristic, project methods, problem solving, analytic, laboratory, and synthetic methods are used for teaching in Pakistani schools.

Koichu, Berman, and Moore (2014) show that mental and reasoning abilities, self-confidence, and intellectual inter-dependence are improved by the

The Effect of Heuristic Teaching Methodology 5

use of heuristic method of teaching. Besides this, it is evident that this prepares them for problem solving and bring self-discipline in students for future. Rudd (2010) proposed that heuristic approach helps students to become skillful problem-solvers and it assists them in transferring and employing their appropriate knowledge to solve innovative problems and situations as well. It also proposed that this technique improves students' perception of their ability to solve problems effectively (Rudd, 2010).

Akkus, Gunel, and Hand (2007) compare and evaluate as to how effective the inquiry-based approach also known as the Heuristic approach versus a traditional teaching practice on the students. The results and findings of the study suggested that the quality of the implementation of the type of teaching approach being used does have a significant impact on the student performance on their post-test scores and that the Heuristic approach has several important advantages within the classrooms settings in contrast to traditional teaching practices. Fasasi (2015) examine the effect of Heuristic Teaching strategy on the academic success of the students, the results showed that Heuristics teaching approach should be employed in teaching mathematics along with the well-trained teachers/facilitators in order to improve and enrich students' academic achievement in the field of mathematics.

Abonyi and Umeh(2014) led a research on the effects of the heuristic method of teaching on students' achievement in the subject of algebra. The findings showed that the heuristic teaching approach is more effective as compared to the traditional teaching approach, which also helps in fostering and promoting students' success in the field of Algebra. . A great deal of literature gap is evident in terms of the effects of heuristic teaching methods in Pakistan giving the researcher the opportunity to assist reducing the literature gap present with respect to this topic in the existing culture of Pakistan.

In the light of the literature, it is hypothesized that 1) there would be the increase in self-esteem and coping responses of students, who will be taught heuristically from the beginning of class and their results will be compared to control group where students will be taught traditionally.

METHOD

Experimental Research Design was used for the present study and self-report questionnaires were used to determine the levels of present self-esteem and coping responses in pretest and posttest. Then results are compared to control group.

Participants

A Sample of 90 students of fourth semester in management science department of BUKC participated. 45 students were in Experimental group and 52 students in control group. The age ranges of participants were 18-25 years. ($M=20.3$; $SD=1.27$). Duration of the intervention implementation was 14 weeks.

The sample was recruited on the basis of the following preestablished inclusion and exclusion criterias.

Students, who are studying “Introduction to Psychology” course in Management Science Department of BUKC. Age range for participants was 18-25 years. Education required was intermediate or “A” levels and must have passed three semesters in BUKC have been included.

Above age students, drop out students from this course in midterm, students with less than 75 percent attendance and those who didn’t appear for midterm exam were excluded.

Measures

Demographic Information Form

The demographic information form consisted of information related to gender, age, education, semester attendance, appearance in exams, marital status and socioeconomic status based on which inclusion and exclusion criterion were decided.

Rosenberg Self-Esteem Scale (Rosenberg, 1965)

Rosenberg self-esteem scale is a ten item Likert scale which assesses an individual's feelings of self-worth when the individual compares himself or herself to other people. The scale is an attempt to achieve a one-dimensional measure of global self-esteem. It was designed to represent a continuum of self-worth, with statements that are endorsed by individuals with low self-esteem to statements that are endorsed only by persons with high self-esteem. The scale can also be modified to measure state self-esteem by asking the respondents to reflect on their current feelings.

Coping Responses to Stressful Situation (CISS) (Endler & Parker, 1990a, 1994)

Coping Inventory for Stressful Situations (CISS) is a 48-item instrument used to measure three basic coping strategies with 16 items per scale: Task-Oriented (T), Emotion Oriented (E), and Avoidance (A); (Endler & Parker, 1990a, 1994). The Avoidance Scale contains two subscales: Distraction (D) and Social Diversion (SD). Items are scored on a 5-point Likert scale (from 1 not at all to 5 very much). Scores for all items per scale are summed to form scale scores; higher scores indicate a greater use of that coping strategy. It has Internal Consistency ranges from .77 to .88 and Test-Retest reliability Ranges from .82 to .85. Criterion Validity noted is .55.

Procedure

Initially, permission letter from the university higher authorities including Dean and Director was sought to conduct research in university premises. After that from the beginning of new session participants studying Introduction to Psychology were given consent form in the first class and purpose of the study was debriefed. They were given self-esteem and coping responses instruments to assess their self-esteem and coping responses levels in the beginning of the class. Similarly, control group participants studying Introduction to Psychology were given consent form and were assessed on the same grounds i.e. self-esteem and coping responses. Experimental group was taught heuristically in 12 sessions and control group was taught traditionally in 12 sessions. For traditional teaching multimedia was used to teach course content. Topics were taught without activities. Heuristic teaching plan and traditional teaching plan were followed in 14 sessions one session was three hours in a week.

Intervention included a heuristic method of instructions i.e. interactive lectures, videos and role plays, especially designed for this experiment whereas for traditional teaching lecture method was used. Course content was delivered by teacher through use of multimedia in form of slides without any activities. Results were compared on the basis of pretest and posttest scores. The score of experimental group i.e. (Heuristically taught) were compared to control group scores i.e. (traditionally taught)

Heuristic teaching plan was constructed with the help of expert's committee in Bahria University, Karachi Campus including Dean, Director and Faculty Members. 14 session detailed plan is as follow.

Session 1: Introduction to Social and Emotional Development

Students were taught Social and Emotional Development” theory by Erikson(1950). They were told to draw a time line of their life with major physical, emotional and social milestones. Then, they were told to discuss one example ideally of their lives that illustrate particular life crises. They were also told to write positive and negative outcome and Present their example to the class.

Session 2: Problem Solving, Critical Thinking and Decision making

Students were exercised in this session to think critically by solving different tasks in group and in pairs. Task involves Motor activity, abstract activities and social and ethical problem-solving tasks.(Postman, Egan – 1949)

Session 3: Emotional Intelligence

Students were taught the difference between Assertive, Aggressive and Submissive behavior. Role play was conducted by students to show the appropriate behavior in certain situations (Bradberry & Greaves, 2006).

Session 4: Multiple Intelligence

Howard Gardner Multiple intelligence theory was taught, and Howard Gardner Multiple intelligence test was administered on students to check which intelligence levels are high in an individual (Gardner, 1992).

Session 5: Stress Management

Students learned Physiology of stress (how it effects body), Types of stress, Cognitive Errors and Stress management techniques. Students were taught to identify stressors, how it is affecting body then introducing students with EFT (Emotional Freedom Technique) to releases instant stress by tapping on different parts of body starting from head till end and deep breathing simultaneously (Barlow, 2007).

Session 6: Memory

Students learned memory types and stages, memory reconstruction, improving memory techniques and about forgetting. Students exercise through role play Method of serial reproduction activity; get to know about their short-term memory through Digit span test and about their learning style (Anderson, 2013).

The Effect of Heuristic Teaching Methodology 9

Session 7: Personality

Sigmund Freud's psychoanalytic theory of personality was taught in class. Assessment of student's personality through objective and projective personality test was done. Other class activities involve defense mechanisms and its real life examples (discussion in groups, exploring personal examples) Analyzing birth order and certain characteristics attached to it (Freud, 2012).

Session 8: Transactional Analysis

Student's learned the Ego-State (or Parent-Adult-Child, PAC) model, Analyzing Transactions, Life positions, Strokes, Games people play, 5 typical features of games and Drama triangle. Johari Window Technique was practiced by students. This is self-awareness technique. Students will look at 4 parts of self-known and unknown to self and others. Secondly, they learn to find errors in communications (Berne, 1958).

Session 9: Anger Management

Students were taught anger management by identifying types of anger, how it affects body, Identifying triggers and techniques to overcome it. Students learned useful coping strategies to overcome anger. They learned how to let go negative emotion and feel the positive ones.

Session 10: Impression Management

Students learned Self-presentation, Motives and strategies of how impression management works and time management. Students were given task to use authentic texts /messages and analyze Impression Management language. Role-play was presented by class groups of common situations like job interview, sitting in restaurants, Small talk, starting a presentation, Opening a meeting and university environment etc. Students learn how to present themselves according to situation and it enhanced their self-esteem.

Session 11: Attribution and Persuasion Theories

Students learned persuasion techniques people use in different situations. Activities related to that will be conducted. Students become aware of the techniques used in conversations, they learned to apply them to independent persuasive writing activities and analyze the work of others to see effective persuasive techniques.

Session 12: Role Play

Students were encouraged for Role play on any society issue or any psychological issue they can come up with, they were encouraged to be as creative as they can and they invited their senior teachers as guests.

Statistical Package for Social Sciences (version 21) was used to analyze results using t-test (independent and pair) method to analyze the formulated hypotheses. Descriptive statistics were used to describe the demographic characteristics of the sample.

RESULTS**Table 1**

Demographic characteristics of Participants (N=90)

Demographic variable		Control Group (n=45)		Experimental Group (n=45)	
Gender		<i>f</i>	(%)	<i>f</i>	(%)
	Male	18	(40)	24	(53.33)
	Female	27	(60)	21	(46.66)
	Single	45	(100)	42	(93.33)
	Married	0		2	(4.44)
	Engaged	0		1	(2)
Family Structure					
	Nuclear	42	(93.33)	38	(84.44)
	Joint	3	(6.66)	5	(11.11)
	Extended	0		2	(4.44)
Socio economic status					
	Middle class (30,000-70,000)	29	(64.44)	43	(95.55)
	Upper middle class (70,000 above)	15	(33.33)	0	
	Upper class (1k+)	1	(2)	2	(4.44)

Table 2

Comparison of Pre and Post-Test Scores of Experimental Group (Heuristic Teaching Method).

Variables	Pre-Test Score		Post-Test Score		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Self Esteem	16.5	4.78	19.77	4.27	6.51***	.000
Task Coping	53	9.83	61.15	7.97	8.41***	.000
Emotional Coping	57.1	10.34	51.63	11.14	8.41***	.000
Avoidance Coping	50.7	6.06	48.5	10.83	-1.60	.116
Distraction Coping	24.3	6.06	21.9	5.63	3.37**	.002
Social Diversion Coping	16.7	4.78	16.1	4.56	3.37**	.002

** $P < 0.00$ *** $P < 0.000$

Table 3

Comparison of Post-Test Scores of Control Group (Traditional Teaching Method) and Experimental Group (Heuristic Teaching Method)

Construct	Heuristic Teaching (Experimental) N=45		Traditional Teaching (Control) N=45		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Self Esteem	19.9	4.19	17.3	7.88	1.94*	0.05
Task Coping	61.2	10.98	52	6.39	5.38**	0.00

						0
						0.
Emotion	51.2	10.95	59.9	9.62	-	0
coping					4.54**	0
						0.
Avoidance	48.4	5.68	53.6	9.92	-2.35	2
Coping						1
						0.
Distraction	21.8	5.63	26.4	7.38	-3.27*	0
Coping						2
						0.
Social						0.
Diversion	16.1	4.6	18.1	4.62	-2.04	4
Coping						4

** $P < 0.00$ * $P < 0.05$

DISCUSSION

The aim of the study was to find the effect of heuristic teaching methodology on self-esteem and coping responses of university students and find the difference in self-esteem and coping responses of university students exposed to traditional teaching and heuristic teaching.

The results show that there was a significant difference in the self-esteem in the pre and post-test of students in the heuristic teaching method in the post tests of the participants (table 2). Similarly there is a significant difference in the coping styles except for avoidance coping after using heuristic teaching as compared to pre intervention. Thus, the heuristic teaching was successful in eliciting a statistically significant increase in all constructs of heuristic group. Similarly, a significant difference was noted in the self-esteem and coping styles except for the avoidance coping and social diversion coping in heuristic teaching group as compared to the traditional teaching group. A study was conducted by Li and Zhang, (2009) which revealed that teaching efficiency and effectiveness has been improved when taught heuristically than traditionally. Similarly, Abonyi and Umeh (2014) led a research on the effects of the heuristic method of teaching on students' achievement. The findings

The Effect of Heuristic Teaching Methodology 13

showed that the heuristic teaching approach is more effective as compared to the traditional teaching approach, which also helps in fostering and promoting students' success (Abonyi & Umeh, 2014).

It was also observed that participants of this research became good friends and started to enjoy working in groups. This had contributed to change in overall their class environment. Al-Fayez and Jubran (2012) conducted research to find out the impact of using the heuristic teaching method on Jordanian mathematics students of tenth grade. It showed that the students who were taught heuristically were more inclined towards the learning.

Similarly, Heuristic teaching has help students to learn by self-experience. It has certainly developed self-confidence and self-reliance in the students. Moreover, it has help them to develop scientific attitude and creativity. The research conducted by Koichu, Berman, and Moore (2014) shows similar findings which indicate that mental and reasoning abilities, self-confidence, and intellectual inter-dependence are improved thorough Heuristic teaching. Besides this, it is evident that this type of teaching prepares them for problem solving and brings self-discipline in students for future. On the other hand, a study was conducted by Perveen (2010) intended to determine and establish the effect of the problem-solving or heuristic methodology on the academic success of mathematics students at the secondary level, the experimental group scored significantly higher on the post-test compared to the control group (Parveen, 2010).

Participants were encouraged throughout tasks provided and were individually guided for solutions which has helped them to explore novel solutions to the problems. They found out that heuristic teaching method is one of the most important teachings and also set forth the implementation of the heuristic teaching method in the management teaching concretely and has provided the scientific reference for the heuristic teaching method and had discouraged use of traditional approach.

Although heuristic teaching has a significant effect on our self-esteem and coping to stress, however, a huge research gap has been observed with regard to teaching methodologies in Pakistan specifically in relation to heuristic teaching due to which the research could not be linked to the Pakistani studies. This research is therefore, helpful for different faculties in employing this methodology for improvements in their students. On the other hand, the findings of this study will benefit teachers of the concerned university as well as others in improving their teachings to benefit themselves as well as students. Heuristic teaching methodology plays a significant role in improving self-

esteem in students and reducing negative coping to stress in university students. It also contributes to the repertoire of research identifying a growing need to address the escalating problems related to coping effectively to stress, accepting oneself, increasing self-esteem in schools, colleges and universities

REFERENCES

- Abonyi, O. S., & Umeh, V. O. (2014). Effects of Heuristic Method of Teaching on Students' Achievement in Algebra. *International Journal of Scientific and Engineering Research*, 5(2), 1735-1740.
- Akkus, R., Gunel, M., & Hand, B. (2007). Comparing an Inquiry-based Approach known as the Science Writing Heuristic to Traditional Science Teaching Practices: Are there differences? *International Journal of Science Education*, 29(14), 1745–1765.
- Al-Fayez, M., & Jubran, S. (2012). The Impact Of Using The Heuristic Teaching Method On Jordanian Mathematics Students. *Journal of International Education Research*, 8(4), 453-460.
- Anderson, J. R. (2013). *Language, memory, and thought*. Psychology Press.
- Arends, R. (2014). *Learning to teach*. McGraw-Hill Higher Education.
- Armstrong, H. E. (1910). *The teaching of scientific method and other papers on education*. London: Macmillan.
- Baig, F. (2015). Application of Teaching Methods in Mathematics at Secondary Level in Pakistan. *Pakistan Journal of Social Sciences (PJSS)*, 35(2), 935-946.
- Barlow, D. H. (2007). *Principles and practice of stress management*. Guilford Press.
- Berne, E. (1958). Transactional Analysis: A new and effective method of group therapy. *The American Journal of Psychotherapy*, 12, 735-743.
- Bradberry, T., & Greaves, J. (2006). *The emotional intelligence quick book: Everything you need to know to put your EQ to work*. Simon and Schuster.

The Effect of Heuristic Teaching Methodology 15

- Deboer, G. (2006). Historical perspectives on inquiry teaching in schools. In *Scientific inquiry and nature of science* (pp. 17-35). Springer Netherlands.
- Endler, N. S., & Parker, J. D. A. (1990a). *Coping Inventory for Stressful Situations (CISS): Manual*. Toronto: Multi-Health Systems.
- Fasasi, K. M. (2015). Effects of Heuristic Teaching Approach on Academic Achievement of Senior Secondary School Mathematics Students in Girei Local Government Area of Adamawa State, Nigeria. *International Journal of Innovative Science, Engineering & Technology*, 2(6)598-606
- Erickson., H. E., (1950). *Childhood and Society*. New York. Norton
- Freud, S. (2012). *The basic writings of Sigmund Freud*. Modern library.
- Gardner, H. (1992). *Multiple intelligences* (Vol. 5, p. 56). Minnesota Center for Arts Education
- Hand, B., Norton-Meier, L., Gunel, M., & Akkus, R. (2016). Aligning teaching to learning: A 3-year study examining the embedding of language and argumentation into elementary science classrooms. *International Journal of Science and Mathematics Education*, 14(5), 847-863.
- Koichu, B., Berman, A., & Moore, M. (2014). Changing Teachers' Beliefs About Students' Heuristics In Problem Solving. *3rd Conference of the European Society for Research in Mathematics Education*. European Society for Research in Mathematics Education.
- Li, C., & Zhang, Q. (2009). A Research on Application of Heuristic Teaching Methods in the Teaching of Management. *International Workshop on Education Technology and Computer Science*, 3, 762–766. Retrieved from <http://www.ifets>
- Nickerson, R., Perkins, D., & Smith, E. (2014). *The teaching of thinking*. Routledge.
- Novak, G., Patterson, E., Gavrín, A., & Enger, R. (1998). Just-in-Time Teaching: Active learner pedagogy with WWW. *IASTED International Conference on Computers and Advanced Technology in Education* (pp. 27-30). Cancun: IASTED .

- Perveen, K. (2010). Effect Of The Problem-Solving Approach On Academic Achievement Of Students In Mathematics At The Secondary Level. *Contemporary Issues In Education Research*, 3(3), 9-14.
- Postman, L., & Egan, J. P. (1949). *Experimental psychology: an introduction*.
- Rayner-Canham, G., & Rayner-Canham, M. (2014). The Heuristic Method, Precursor of Guided Inquiry: Henry Armstrong and British Girls' Schools, 1890–1920. *Journal of Chemical Education*, 92(3), 463-466.
- Rosenberg, M. (1965). Rosenberg self-esteem scale (RSE). Acceptance and commitment therapy. *Measures package*, 61, 52-61.
- Rudd, D. M. (2010). *The Effects of Heuristic Problem-Solving Strategies on Seventh Grade Students' Self-Efficacy and Level of Achievement in Mathematics*. The College at Brockport.
- Snyder, L., & Snyder, M. J. (2008). Teaching critical thinking and problem solving skills. *The Journal of Research in Business Education*, 50(2), 90-99.