# EFFECT OF JIGSAW METHOD ON STUDENTS' RESEARCH ANXIETY: A CASE OF PUBLIC UNIVERSITY IN PAKISTAN

## Farhana Shams* Dr. Aroona Hashmi**

**\***PhD Scholar,
Institute of Education and Research, University of the Punjab, Lahore.
E-mail: missfarhanagee@gmail.com
** Assistant Professor, Department of Secondary Education, Institute of Education and Research, University of the Punjab, Lahore.
E-mail: aroonahashmi@gmail.com

## Abstract
*The aim of this study was to find out the effect of jigsaw method on research anxiety (RA) of public university in Lahore. This study was quantitative in nature and qusai experimental research design was used. The sample two intact groups (30 students in each group) were conveniently selected for this experiment. The duration of treatment was 16 weeks in the form of introductory research method course and control group was taught through conventional teaching method. Research anxiety rating scale (RARS) was adopted and used as pre and post-test for both groups. Data were analyzed by using SPSS (Independent Samples t-test and paired sample-test). Findings revealed that experimental group who taught through jigsaw method showed decreased level of RA than the control group. It is recommended that jigsaw method of teaching may be used for university students to develop research culture in our universities.*

*Keywords***:** Jigsaw, Research Anxiety, Research Culture, RARS, Higher Education,

## Introduction

Anxiety is referred as an emotion consisting of stress, restlessness, and hypertension such as elevated blood pressure (American Psychological Association, 2019). Anxiety problems are characterized by recurrent repetitive feelings or fears. They can avoid such circumstances because they are concerned. They can also experience physical symptoms such as sweating, shaking, dizziness, or fainting.

It interrupts reasoning, disrupting and degrading academic success by reducing information retrieval capabilities and encouraging evasion, inattention, and pessimistic thoughts (Onwuegbuzie .et al., 2001). Sadness, annoyance, fear, worry, headaches, unidentified ailments, crying, and violent outbursts are also possible outcomes (Onwuegbuzie et al., 1997). Stress, both chronic and acute, can erode ego and self-competence, led to failure fears, impatience, and compromising learning (Johnson & Onwuegbuzie, 2004; Onwuegbuzie & Wilson, 2003).

## Research Anxiety

"RA" is declination towards doing research, experiencing depression, feeling uncertain and nervousness, being in a state of ever-growing terrific troubles and miseries despite possessing the capacity and chances to overcome all hurdles that could come in the way of research projects completion (Cokluk-Bokeoglu and Ylmaz (2005).

It is a general observation that when students experience any anxiety towards research or any related activity, they tend to show reluctance and lose interest and develop negative attitude toward it. Eventually they stop doing research and quit it altogether. Anxiety is pivotal in mounting pressure on graduate students, putting them in strenuous struggle of thesis completion. Furthermore, students delay their thesis work completion as a result of persistent anxiousness (Rezaei et al., 2013).

"RA" include such attributes that individuals experience as worrisome to an extent that it retards productivity in research processes (Higgins & Kotrlik, 2006).Researches

revealed that there exists close interrelated relation between self-efficacy and anxiety in educational realm (Shelton & Mallinckrodt, 1991; Griffin, no date).

According to Mcgrath (2002), senses of being feared, flawed, and anxious often lead to delay in completing their thesis, and most of them with significant anxiety fail to cope with entire research process. Certainly, those had faced these problems earlier in completion and submission of their thesis must have witnessed themselves anxious and nervous throughout research doing process (Carbonell, 2019). According to Griffin, confidence level in students play key role in their dissertation completion. Higher level of confidence results in enhanced ability to complete thesis in comparison to those students with low confidence. It plays a challenging role in research activities as students show less negativity towards the whole process of thesis completion. Dissertation stress has become an unclimbable mount in research work. Every individual have to confront and likely to show higher dedication for thesis (Griffin, no date).

According to Onwuegbuzie (1997), anxiety that students experience while doing research is also related to stress that they come across during the course of studying research methodology subject. Studies revealed that "RA" is a multifaceted mechanism which comprises other anxieties such as library related search, solving statistical problems, and thesis completion process (Onwuegbuzie, 1997).

Research has attained central position in teacher education program offered at every level. Research methods have become inevitable among different courses offered around the globe as a essential part of higher education institutions. Numerous studies reported anxiety in students towards research related activates like research course (Adams & Holcomb, 1986). Jigsaw is very effective method of teaching that does not create threatening situations in the class (Aronson, 2000).

One method to help address the issue of "RA" is ensuring that teaching strategies are reinforcing positive attitudes towards research, and helping the teacher solidify their grasp on research (Azmin, 2016). According to Beilock & Mahoney (2015), anxiety and fear is reduced in a jigsaw environment.

Eliot Aronson invented this technique for the first time in 1978 (Aronson & Patnoe 1997; Hedeen, 2003). This technique mix students in different small groups to solve jigsaw puzzle, complete an assignment, understand a piece of information and finally create a final product. Aronson et al., (1978) stated that this technique is unique in rendering different provisions such as it is responsible for generating strong interaction in student members of group, development of optimistic attitudes toward group members, respect towards others and self-esteem boosts meaningfully, it discourages agonizing behaviors, stress and discriminations, Improvements in learning performances are elevated. There appears redundancy in usual inclinations towards competitiveness as they work together with common aim and objectives and enhances their empathetic approach towards all. It promotes sense of responsibility and embellishes group and peers as the source of knowledge rather than opponents (Fernandez et al., 2011; Laal et al., 2012).

Students will consciously participate in the learning process by using the Jigsaw technique. Students should feel more at ease with their positions after repeated exposures to this technique. A method of assessment of the collective group may improve its efficacy by holding each member accountable for the group's results (Lucas, 2000).

As a result of numerous experiments on the Jigsaw technique, several improvements were introduced into the technique during the rehearsal phase, and new forms of techniques appeared. Jigsaw is used as motivational technique for students as it able to accept responsibility of not only understanding and learning something but also to pass this knowledge their fellows. It also provides each individual a chance to prove oneself. It makes students able enough to behave like teacher. Students discuss and communicate in such a

way that even reticent student in class get a chance to speak in group. It induces leadership among group members. It is found that the jigsaw technique provides flexible practices and enormous variations. It is among the mostly studied and quite frequently utilized group work techniques (Doymus et al., 2010; Hedeen, 2003).

**Statement of the problem**

Research course is mandatory requirement for the fulfillment of most of the postgraduate degree programs. It is expected from students that after this course they will search a novel and significant research problem and conduct a methodologically sound research. Research suggests that teachers' instructional practices can be helpful in reducing students' "RA". Therefore, there is need to determine the level of significance and contribution of innovative collaborative learning technique for changing the students research self-efficacy beliefs and to reduce research disquietude. Present study aims to find out the effect of jigsaw method on students' "RA" in a public sector university.

**Objectives**

This study entails following objective:

1. To find out the effect of jigsaw method on student's "RA" in public university X

**Hypotheses**

$H_0 1$: There is not a statistically significant difference in the experimental group pre and post-test mean scores of "RA".

$H_0 1.1$: There is not a statistically significant difference in pre-test mean scores of "RA" in experimental and control group.

$H_0 1.2$: There is not a statistically significant difference in post-test mean scores of "RA" of experimental and control group.

**Design**

This study is quantitative in nature and quasi-experimental (Pre-test and Post-test control group) design was used.

**Table 1**

*Pre-test and Post-test Control Group Design*

| Groups | Pre-test | Treatment | Post-test |
|---|---|---|---|
| Experimental Group | O | X | O |
| Control Group | O | C | O |

**Sample**

The sample of this study was consisting of 60 M.A secondary education students from education discipline of public university X in District Lahore, Punjab, Pakistan. Two intact groups from department of secondary education from public university X selected conveniently, who offered an introductory course on research methods in education to their students.

In qusai-experimental design random assignment of individuals was not possible; however, treatment was randomly assigned to the groups. A pre-test of "RA" were taken from all the students of both experimental and control groups. After pre-test both groups had given the same reading material of the course of research methods in education. However, experimental group exposed to the treatment in the form of Jigsaw method, whereas control group was taught trough conventional method of instruction. At the end of the intervention of 16 weeks, post-test was conducted for both experimental and control groups to find out the effect of treatment.

**Instrumentation**

In present study Research Anxiety Rating Scale (RARS) developed by Onwuegbuzie (2013) was used as pretest and posttest to find out the students "RA".  This instrument consisted of seven factors that are namely: i) fear of libraries, ii) fear of writing, iii) fear of statistics, iv) fear of conducting research, v) fear of research language, vi) fear of research courses, and vii) perceived utility and competence. This instrument is Likert-type rating scale having 45 items, Strongly Agree to strongly disagree. Researcher validated this instrument by experts of relevant field. Cronbach's Alpha calculated for reliability.

*Reliability of RARS*

| Cronbach's Alpha | N of Items |
|---|---|
| .783 | 7 |

Table shows that the Cronbach's coefficient alpha of the scale with seven factors was 0.783, which showed the scale had good reliability.

**Intervention**

In qusai-experimental design randomization is not possible, however treatment was assign randomly. Researchers randomly assigned two intact groups as experimental and control group. Researcher taught course of research methods to experimental group for the duration of 16 weeks. Control group was taught through traditional (lecture) method of teaching.

**Data Collection and Results**

Both groups were pre tested.  After pretest, researcher has given intervention only to experimental group with JIGSAW method of teaching.  In the end of intervention, both groups were post tested. Data were analyzed through Statistical Package for Social Sciences (SPSS) 18. Inferential statistics i.e., Paired Sample t-test and Independent samples t-test was used.

$H_0 1$:    There is not a statistically significant difference in pretest mean scores of "RA" in experimental and control group.

Table 2

*Independent samples t-tests for pre-test scores of experimental and control group comparisons*

| Groups | Scores | N | Mean | SD | df | t-value | Sig. |
|---|---|---|---|---|---|---|---|
| Experiment | Pre-test | 30 | 3.77 | .127 | 58 | .300 | .765 |
| Control | Pre-test | 30 | 3.76 | .121 | | | |

p*<0.05

The above table shows that there is not a statistically significant difference between the mean scores for 'RA' of experimental group (M =3.77, SD = .127), and control group (M = 3.76, SD = .121); t (58) = .300, p= .765 (two-tailed) before intervention. The null hypothesis "there is not a statistically significant difference in pretest mean scores of "RA" in experimental and control group" is accepted. Experimental and control group were at same level of RA before intervention.

$H_0 1.1$: There is no significant difference in the experimental and control group "RA" mean scores of post-test.

Table 3

*Independent samples t-tests for post-test scores of experimental and control group comparisons*

| Groups | Scores | N | Mean | SD | df | t-value | Sig. |
|---|---|---|---|---|---|---|---|
| Experiment | Post-test | 30 | 1.74 | .053 | 58 | 55.403 | .000 |
| Control | Post-test | 30 | 3.65 | .180 | | | |

p*<0.05

The above table shows that there is a statistically significant difference between the mean scores for 'RA' of experimental group (M = 1.74, SD = .053), and control group (M = 3.65, SD = .180); t (58) = 55.403, p= .000 (two-tailed). It indicates that "RA" of experimental group is decreased in comparison of control group. Eta squared value is 0.98. This value showed that there is moderate effect of intervention on experimental group. Null hypothesis is "rejected".

$H_01.2$: There is not a statistically significant difference in the experimental group pre and post-test mean scores of "RA".

Table 4

*Paired sample t-test for experimental group pre-test and post-test scores comparison*

| Groups | Scores | N | Mean | SD | Df | t-value | Sig. |
|---|---|---|---|---|---|---|---|
| Experimental | Pre-test | 30 | 3.77 | .12 | 29 | 75.12 | .000 |
| Experimental | Post-test | 30 | 1.74 | .05 | | | |

p*<0.05

The above table shows that there is a statistically significant difference between pre-test and post-test mean scores of experimental group for 'RA'. Pre-test M = 3.77, SD = .12), and post-test (M = 1.74, SD = .05); t (29) = 75.12, p= .000 (two-tailed). It indicates that "RA" of experimental group is decreased in after intervention. Eta squared value is 0.99. This value showed that there is large effect of jigsaw intervention on experimental group. Null hypothesis is "rejected".

**Discussion**

The aim of present study is to find out the effect of Jigsaw method on students "RA" in a public sector university. Earlier studies reported students' negative attitude, lack of interest, anxious behavior towards research and research related activities. Under anxiety threatening conditions students not only take interest in research but also procrastinate research related activities. Results of this study are very useful for university teachers in decreasing their students' anxiety and make them able to be good researchers. There are only few researches related to this to find out the effect of any student centered approach to reduce especially students' "RA" at university level. The researcher tried to study this phenomenon with the qusai-experimental design. In qusai-experimental design, researcher has given intervention in the form of introductory research methods course to experimental group with jigsaw method of teaching.

The first hypothesis was "$H_01$: There is not a statistically significant difference in pre-test mean scores of "RA" in experimental group and control group". Results of $H_01$ revealed that at the start of experiment and before intervention students of both experimental and control group having same level of "RA". This null hypothesis was accepted. This result expended the results of Adullah et al., 2014; Bibi et al., 2012; Butt & Shams, 2013; Elliot et. al., 2013; Merc, 2016.

The second hypothesis was "$H_01.1$: There is no significant difference in the experimental and control group "RA" mean scores of posttest". Results of $H_01.1$ revealed that after intervention and post-test of both experimental group and control group it is seen that "RA" of experimental group is decreased in comparison of control group (which is taught through conventional lecture method). Eta squared value is 0.98. This value showed that there is moderate effect of intervention on experimental group. Null hypothesis is "rejected". This results was similar to the results of Adullah et al., 2014; Butt & Shams, 2013; Merc, 2016; Rezaei & Zamani-Miandashti, 2013.

The third hypothesis was "$H_0$1.2: There is not a statistically significant difference in the experimental group pre and post-test mean scores of "RA" Results of $H_0$1.2 revealed that "RA" of experimental group is decreased after intervention. Eta squared value is 0.99. This value showed that there is large effect of jigsaw intervention on experimental group. Null hypothesis is "rejected". This finding was similar to the findings of Kracker, 2002; Merc, 2016; Rezaei & Zamani-Miandashti, 2013; Van der Westhuizen, 2015.

## Conclusion

This aim of current study was to examine the effect of Jigsaw on students' research anxiety. Findings reveled that at the start of experiment both experimental and control group were at same level of research anxiety. After the intervention of 16 weeks results showed the decreased level of research anxiety in experimental group. Thus on the basis of the findings it is concluded that jigsaw technique is very effective to reduce research anxiety of students. It is also concluded that student centered teaching approaches especially group work can help students in reducing psychological pressures like stress and anxiety consequently promoting research culture.

## Recommendations

In this study, it is clearly seen that jigsaw method of teaching has an effect on students' "RA" of public university. Results also revealed that Jigsaw method of teaching is very effective for university students in decreasing the "RA" level. Jigsaw method is very useful to reduce the level of psychological pressure and research related anxiety. Moreover it can increase research culture in Pakistani universities.

## Suggestions for Further Studies

1. In this study quantitative qusai-experimental design was used, future researchers may use mixed method design to explore this phenomena.
2. In study it is it is found that jigsaw method have an effect on research anxiety; further researcher may use larger sample size and other discipline.

## References

Abdullah, A., Erfanmanesh, M. A., & Karim, N. H. A. (2014). Information seeking anxiety: Concept, measurement and preliminary research. *International Journal of Information Science and Management*, *12*(1), 47-64.

Adams, N. A., & Holcomb, W. R. (1986). Analysis of the relationship between anxiety about mathematics and performance. *Psychological Reports*, *59*(2), 943-948.

American Psychological Association (2019). *Anxiety.* Author.

Aronson, E. (2002). Building empathy, compassion, and achievement in the jigsaw classroom. In *Improving academic achievement* (pp. 209-225). Academic Press.

Aronson, E., & Patnoe, S. (1997). *The jigsaw classroom: Building cooperation in the classroom* (2nd ed.). Addison Wesley Educational Publishers.

Aronson, E., Stephan, C., Sikes, J., Blaney, N., &Snapp, M. (1978). *The Jigsaw Classroom.* Sage.

Azmin, N. H. (2016). Effect of the Jigsaw-Based Cooperative Learning Method on Student Performance in the General Certificate of Education Advanced-Level Psychology: An Exploratory Brunei Case Study. *International Education Studies*, *9*(1), 91-106.

Beilock, S. L., & Maloney, E. A. (2015). Math anxiety: A factor in math achievement not to be ignored. *Policy Insights from the Behavioral and Brain Sciences*, *2*(1), 4-12.

Bibi, F., Lqbal, H. M., & Majid, N. (2012). Attitude of prospective teachers towards research: Implications for teacher education in Pakistan. Contemporary Educational Researches Journal, 2(1), 8-14.\

Butt, I. H., & Shams, J. A. (2020). Master in education student attitudes towards research: A comparison between two public sector universities in Punjab. *South Asian Studies*, *28*(1).

Carbonell, D. (2019). *Anxiety helps for fear and phobias.* Anxiety Coach. https://www.anxietycoach.com/

Cokluk-Bokeoglu, O., & Yilmaz, K. (2005).College students thinking critically relationship between research attitudes and research concerns attitudes of university students. *Educational*

*Administration: Theory and Practice, 11* (41), 47-67.

Doymus, K., Karacop, A., & Simsek, U. (2010). Effects of jigsaw and animation techniques on students' understanding of concepts and subjects in electrochemistry. *Educational technology research and development, 58*(6), 671-691.

Elliott, W., Choi, E., & Friedline, T. (2013). Online statistics labs in MSW research methods courses: Reducing reluctance toward statistics. *Journal of Social Work Education*, *49*(1), 81-95. doi: 10.1080/10437797.2013.755095

Griffin, B. W. (n.d.). *Graduate student self-efficacy and anxiety toward the dissertation process.* A sample report for the mini-research project for EDUR, 9131. http://www.bwgriffin.com/gsu/courses/edur9131/activities/EDUR_9131_sample_research_study_dissertation_process.pdf

Hedeen, T. (2003). The reverse jigsaw: A process of cooperative learning and discussion. *Teaching Sociology, 31*(3), 325-332.

Higgins, C., & Kotrlik, J. (2006). Factors associated with research anxiety of university human resource education faculty. *Career and Technical Education Research, 31*(3), 175-199.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.

Kracker, J. (2002). Research anxiety and students' perceptions of research: An experiment. Part I. Effect of teaching Kuhlthau's ISP model. *Journal of the American Society for Information Science and Technology*, *53*(4), 282-294.

Laal, M., & Ghodsi, S. M. (2012). Benefits of collaborative learning. *Procedia-Social and Behavioral Sciences, 31,* 486-490.

Lewis-Fernández, R., Hinton, D. E., Laria, A. J., Patterson, E. H., Hofmann, S. G., Craske, M. G., ... & Liao, B. (2011). Culture and the anxiety disorders: recommendations for DSM-V. *Focus*, *9*(3), 351-368.

Lucas, C.A. (2000). Jigsaw lesson for operations of complex numbers. *PRIMUS, Problems, Resources, and Issues in Mathematics Undergraduate Studies 10*(3), 219-22.

McGrath, S. (2002). Skills for development: A new approach to international cooperation in skills development*?. Journal of Vocational Education and Training, 54*(3), 413-430

Merc, A. (2016). Research anxiety among Turkish graduate ELT students. *Current Issues in Education, 19*(1), 1-14.

Onwuegbuzie, A. J., & Wilson, V. A. (2003). Statistics anxiety: Nature, etiology, antecedents, effects, and treatments-a comprehensive review of the literature. *Teaching in Higher Education, 8*(2), 195-209.

Onwuegbuzie, A. J., DaRos, D., & Ryan, J. (1997). The components of statistics anxiety: A phenomenological study. *Focus on Learning Problems in Mathematics, 19*(4), 11-35.

Onwuegbuzie, A. J., Slate, J. R., & Schwartz, R. A. (2001).Role of study skills in graduate-level educational research courses. *The Journal of Educational Research, 94*(4), 238-246. https://doi.org/10.1080/00220670109598757

Rezaei, M., & Zamani-Miandashti, N. (2013). The relationship between research self-efficacy, research anxiety and attitude toward research: A study of agricultural graduate students. *Journal of Educational & Instructional Studies in the World, 3*(4), 69-78.

Shelton, D. M., & Mallinckrodt, B. (1991). Test anxiety, locus of control, and self-efficacy as predictors of treatment preference. *College Student Journal*.

Van der Westhuizen, S. (2015). Reliability and validity of the attitude towards research scale for a sample of industrial psychology students. *South African Journal of Psychology*, *45*(3), 386-396.