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Impact of Resilience Intervention Program on achievement in Science of Elementary School Students

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ABSTRACT

Resilience is the skill and the capacity to be robust under conditions of enormous stress and change (Coutu, 2002). It is the successful coping with stressful situations that fosters a sense of mastery and appropriate responsibility, leading to increased mental health and the belief in the individual's ability to cope with future stressors (Jew, Green & Kroger, 1999). The purpose of this study was to examine the effect of Resilience Intervention Program on achievement in science of elementary school students. A pretest-posttest control group design was used in this study. The study was conducted on a total of 80 students studying class 8 of a government school of Chandigarh. The control and experimental groups had 40 students each. The experimental group was subjected to Resilience Intervention Program (developed by the researcher) and the control group was taught using traditional teaching methods. Data were collected through achievement test constructedand standardised by the researcher. For analyzing the data, two-way analysis of variance was used. According to research results, statistically significant difference between experimental and control groups' achievement in science was found. Additionally, it was found that girls outperformed boys in the scores of achievement test.

1. Introduction

We all face challenges in our life. It has been seen that these challenges that an individual faces in day to day life have an everlasting impact. It results in an ability to thrive, mature, and increase competence in face of adverse circumstances (Gordon, 1995). It makes a person stronger and more experienced and ready to face the next challenge in one's life. Resilience is the human capacity of all individuals to transform and change, no matter what their risk: it is an innate "self – righting mechanism"(Lifton, 1994). As per Henderson & Milstein(1996) after the family, educators are best positioned to provide the supportive conditions that promote resiliency in youth.

As educators most of the time teachers do not have much control over the external factors that are provided by the child's family or neighborhood. In such cases the educators can focus on inner adaptation systems of the child to equip the child with assets that can protect them and counter balance the deficits in their environment. They can be trained to face the adversities with courage and accept the challenges that the risks around them provide.

2. Resilience

As per Connor and Davidson (2003), resilience is a multidimensional characteristic that varies with context, time, gender, age and cultural origin as well as within an individual subjected to different life circumstances. The resilient behaviour may be in response to adversity in the form of maintenance or normal development despite the adversity, or a promoter of growth beyond the present level of functioning. Further, resilience may be promoted not necessarily because of adversity, but, indeed, may be developed in anticipation of inevitable adversities (Grotberg, 1997).

3. Achievement in Science

Achievement is something which gives a sense of accomplishment in any personal act, or acquired knowledge, no matter how simple. Something might be a major achievement for a person but it could be a minor thing for another. It is anything which makes one feel good and confirm his/her capabilities to himself or herself. Even a small bit of information received or knowledge acquired adds to one's store of confidence and pushes one farther along the road to self-development.

Crow & Crow (1969) have stated that achievement means the extent to which a learner is profiting from a given area of instruction. In other words, achievement is reflected by the extent to which a person from the training imparted to him, has acquired a skill or knowledge.

Science is able to explain the mechanics and reasons behind the daily functioning of complex systems, which range from the human body to sophisticated modern methods of transport. Children and students are able to use this knowledge to understand new concepts, make well –informed decisions and pursue new interests. Science also helps to provide tactile or visible proof of many concepts, make well informed decisions and pursue new interests. Science instills a sense of hope in the minds of the young students- that anything is possible.

4. Resilience Intervention Program

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An intervention is a combination of program elements or strategies designed to bring about changes in behaviour or improve the health status among individuals or population as a whole. Interventions may be in the form of educational programs, new or better policies, improvements in the environment, or a health promotion campaign. It is seen that interventions that include many strategies are usually the most effective in producing desired and lasting changes. Interventions are strategic, purposeful adult actions that prevent learning difficulties and accelerate, and/or enrich student learning (Capello, Lofaso and Ouchida, 2008). The Resilience Intervention Program comprises of various strategies to provide formal as well as informal opportunities to students to build resilience in them, with the aim of preparing children for life.

A universal, generalist approach has been adopted as this approach suggests that the same factors that benefit children in adversity (caring adults, high expectation messages, and meaningful opportunities to participate) benefit normally developing, already motivated children, as well (Solomon, Watson, Schaps & Lewis (2000). Walker, et al. (2005) found that when schools implement programs that build resilience in this way, they are able to focus on the development of the child as a whole. A model of Resilience Intervention program was proposed by the researcher which was based on the theory of Grotberg (1995). The model proposed that in order to build resilience among students they should be supported and provided opportunities to discover and develop their strengths. They should be trained to develop an ability to manage, emotions and behaviour, ability to focus on positive or helpful ways of thinking.

So as to achieve the objectives of the Resilience Intervention program various strategies were conceived and designed by the researcher. The Resilience Intervention Program included formal teaching opportunities and the informal learning through modelling and for practicing new skills. For providing formal teaching opportunities lessons plans were designed based on content from class 8 science curriculum. Informal learning opportunities were provided through Green Garden Healthy Garden project, Know myself modules and Playing together modules.

5. Significance of the Study

Life is becoming challenging day by day. Students today are facing many challenges and to achieve academically is one of the most important challenge for them. To achieve academically a student must have the ability to accept failures and use them as stepping stones for future success. Our students today need to be trained to be resilient. Research supports that resilience is not a genetically acquired trait but can be inculcated in a child through proper guidance and training. Hence the teachers in the classrooms must follow strategies that help students develop resilience, which will not only help them to face challenges in life but also have a positive impact on their achievement levels. This led the investigator to find out the impact of Resilience Intervention Program on achievement in science of the students.

6. Objectives

1. To study the impact of Resilience Intervention Program on achievement in science of elementary school students.
2. To study the impact of gender on achievement in science of elementary school students.
3. To study the interaction effect of Resilience Intervention Programme and gender on achievement in science among elementary school students.

7. Hypotheses

1. There exists no statistically significant effect of Resilience Intervention Programme on achievement in science of elementary school students.
2. There exists no statistically significant effect of gender on achievement in science of elementary school students.
3. There exists no statistically significant interaction effect of Resilience Intervention Programme and gender on achievement in science of elementary school students.

8. Method

A pre test post test control group design has been employed to study the effect of Resilience Intervention Program on achievement in science. A sample of class 8 students from two intact classes was taken which were grouped into experimental and control group randomly. Each class comprised of 40 students. Therefore the final sample comprised of 80 students with 40 students in each group. A standardised achievement test was constructed by the researcher to collect data on achievement in science before and after the intervention programme. Mean and SD on pre test scores of achievement test in science were calculated, to check the equivalence of the two groups and no significant difference was found between them.

After the data was collected in the beginning and the end of the experiment data was scored, tabulated and statistically analysed. The analysis was done by using two-way ANOVA at 0.01 level of significance by using SPSS (version 22). The results obtained were interpreted to study the impact of Resilience Intervention Program on achievement in science of elementary school students.

9. Data Analysis and Findings

On the basis of analysis the results are presented below.

Table 1: Showing impact of Resilience Intervention Program and gender on achievement in science

Dependent Variable: Achievement in Science						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intervention	398.292	1	398.292	11.838	.001	.135

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Gender	283.761	1	283.761	8.434	.005	.100
Intervention*Gender	90.155	1	90.155	2.680	.106	.034
Error	2557.036	76	33.645			
Total	12922.000	80				
a. R Squared = .211 (Adjusted R Squared = .180)						

It can be seen in Table 1 that there is a significant difference between the mean gain scores of achievement test in science of experimental and control group as the value of F (11.838) at df (1, 76) for Resilience Intervention Program clearly indicates the significant impact of Resilience Intervention Program on achievement in science of class 8 students.

Table 2: Table showing mean of mean gain scores on Achievement in science of control and experimental group

Descriptive Statistics			
Dependent Variable: Achievement in Science			
Group	Mean	SD	N
Exp	12.95	5.909	40
Control	9.05	6.357	40

From table 2, the mean of scores of control group was found to be 9.05 and that of the experimental group was found to be 12.95 on the variable of achievement is science. This showed that the Resilience Intervention Program had a better impact on the experimental group as compared to the control group.

The value of partial eta squared was also found to be 0.135, hence revealing 13.5% of the variance in the achievement in science is accounted for by the resilience intervention program.

Hence the null hypotheses stating that, “There exists no statistically significant effect of resilience intervention programme on achievement in science of elementary school students.” stands rejected. In other words class 8 students of experimental group who were subjected to intervention program are found to have higher achievement in science as compared to class 8 students of control group who were subjected to the traditional teaching methodology.

In order to further explore the second objective emphasizing the impact of gender on achievement in science of class 8 students, table 1 shows a significant value of F (8.434) and p<.01 indicates gender has a significant effect on achievement in science.

Table 3: Table showing mean of mean gain scores on Achievement in science of girls and boys

Descriptive Statistics			
Dependent Variable: Achievement in Science			
Group	Mean	SD	N
Girls	12.55	5.843	38
Boys	9.60	6.633	42

From table 3, the mean of scores of girls was 12.55 and that of boys is 9.60. This shows that the girls performed better than boys in achievement test in science.

The value of Partial Eta Squared was also calculated which is found to be .100, hence revealing 10% of the variance in achievement in science accounted for by the gender.

Thus the hypotheses “There exists no statistically significant effect of gender on achievement in science of elementary school students” is rejected.

The significant difference in achievement in science between girls and boys class 8 students may be attributed to the seriousness of girls towards education as compared to boys who seemed less serious when the various modules of the intervention program were conducted.

Table 3 shows the interactional effect of Resilience Intervention Program and gender on achievement in science, which is found to be insignificant (F=2.680, p>.01), thus highlighting the fact that both independent variables collectively have failed to produce any significant effect on achievement in science on class 8 students. Thus insignificant interaction effect of both independent variables on achievement in science is observed. The third hypotheses stating that “There exists no statistically significant interaction effect of resilience intervention programme and gender on achievement in science of elementary school students”, has not been rejected.

10. Discussion

In this research it was determined that the Resilience Intervention Program designed by the researcher had a significant effect on the achievement in science of class 8 students. The researcher taught cell structure and function,

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coal and petroleum and conservation of natural resources using strategies that helped develop a spirit of cooperation, helped students recognize their self-worth and understand their strengths. Opportunities were provided to each student of the experimental group to recognize their role as an important member of the group. The control group was taught by traditional teaching methods, taking care that the students are able to understand the content well. The experimental group was also subjected to Green Garden Healthy Garden Project, Know myself modules and Playing together modules. .

It was seen that when child centered approach of teaching was followed children felt empowered and enthusiastically worked in groups. The students were provided the opportunity to discover and construct their own understanding of the content matter in the class. The hands on activities were performed by the students under the guidance of the researcher, helped the students develop a better understanding of the concepts. Child centric approaches such as cooperative learning have been seen to improve the achievement level of the students (Slavin, 1983). Moreover science as a subject lends itself to activity based learning as compared to traditional lecture method (Amuthavalli & Shivkumar, 2014; Shah & Rahat, 2014). The cooperative learning methods teaches interdependence and supporting each other which helps develop resilience(Garmezy,1974).Moreover Green Garden Healthy Garden project, Know myself modules and Playing together modules based on various dimensions of resilience also helped in improving the achievement scores of students. The findings of the present study can be confirmed by the study on at-risk students that shows that resilience has been found to be positively related to their GPAs (Lee, D. D. 2009; Banatao, E. J. 2011).

It was also seen that the girls performed better than boys in the achievement test in science. This study is in agreement with Wilberg and Lynn (1999), who arrived at a similar conclusion for achievement test in history. The authors explained this pattern by stating that females tend to work more conscientiously and have a stronger work ethic than males. A descriptive survey conducted on 208 students of secondary school students in Delhi. The data analysis of the study showed that there was gender difference with respect to scientific attitude and science achievement scores and the results were in the favour of girl students(Ahuja, 2017).Also a study which was designed to establish the gender differences in academic resilience and academic achievement among secondary school students in Kiambu County, found the results in favour of girls (Nyambura Mwangi, 2017).

Further it was seen that there was no interaction effect of Resilience Intervention Program and gender on achievement in science. The Resilience Intervention Program designed by the researcher did not favour any gender. All the activities aimed at involving both boys and girls equally in all activities. Hence the interaction between the two was not found.

11. Conclusion

It can be concluded from the present study that Resilience Intervention Program if adopted in school can have a positive impact on the achievement in science of the students. Girls show better performance than boys as far as achievement in science is concerned, but the two factors i.e. Resilience Intervention Program and gender do not have much interactive effect on the achievement in science.

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