

INTERVENTION OF TRANSACTIVE LEARNING DURING GAME RESOURCE DEVELOPMENT PROGRAMME FOR CREATIVE PROBLEM SOLVING

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Abstract: *The needs to aspire learner to learn and to awaken their inquisitiveness different teaching practices have emerged. Amongst the innovative practices recognized in enhancing learners active involvement is the Gaming method. An educational game is the game planned to allow humans learn about a specific subject and/ or a skill. Games and games-based learning are integral component for learning where combination of individual minds and the communication amongst them comes into play known as transactive memory system. The objectives of this paper was to study the effect of Game Resource Development Program, Transactive Learning and their interaction on creative problem solving by considering Pre-Creative Problem Solving as covariate as well as to analyze the change in reaction towards Game Resource Development Program amongst teacher trainees before and after the treatment. Pre Post Non Equivalent Control Group design was used on 89 under graduate teacher trainees. Passi-Usha Test of Creativity, Transactive Memory System Scale, Reaction towards Game Designing tolls were administered respectively. On analyses of the procured data it was found that there was significant effect of the resultant of interaction between GRDP and Transactive learning and teacher trainees expressed favorable reaction in the end of the treatment as compared to earlier period of the treatment. The study intends to aspire the teachers and teacher trainees for undertaking designing of game in their respective subject so as have a better communication and retention of information.*

Key words: *Creative problem solving, Game Resource Development Program, Transactive learning.*

1. INTRODUCTION:

Educational games are games purposively designed for the education, or having educational values. Designing of Educational games are meant for helping people understand concepts, disciplinary knowledge, and develop problem solving skills as participants proceed with the game. They assist acquiring skill and specific subject proficiency. Games are interactive play where rules, adaptation, and problem solving, developed. Games assist students have problem relating to focusing during lectures. Moreover, for a student to play the game can be fun making them attentive. An affective educational game simultaneously teaches & entertains. Moreover the students may also find educational games to be a simple way to learn. Therefore, it is essential that future teachers adopt this strategy of designing a game for educational purposes. Game design involves creating aims, regulation and including challenges as well as promotes communication. Game design is part of resource development. According to Salter (2013) the game designing includes the following steps. The first **Imagining** includes brainstorming of educational subject, a central craftsmanship, with clear theme and concept. Creative thinking can be chosen as well as combined with competitive challenges. The second step is **Designing** which allows determining the inclusion of final details of a design. Images and pictures can be chosen for creating own design of a game. The last step **Revision** is pronounced as a, “phase that includes evaluation of the game concept, revising & eliminate the “without fun” part & then rewriting the game rules & redesigning the material.

In the designing phase Transactive Learning can have a prominent role. **Transactive Learning** is a process of working together in group. Individuals grasp different knowledge in comparison to shared information. Further the members of the group pursue in transactions by supporting by recalling the accumulated information. In group task when two designers spend time with each other or operative together, they create a shared accumulation of knowledge between the designers as members. In substance, one designer of the group stores the information and then recalls that information by asking their partner about it.

Educational Games have been studied in terms of socio-scientific, humanistic and with industry perspective. Studies have been carried out in respect to games and problem solving but in reference to creative problem solving only one article of foreign origin could be located. This gap in research in respect to game designing and creative problem solving required an investigation to find out how game designing could affect creative problem solving. Moreover, the moderator that could have an interaction effect on creative problem solving also needed to be studied.

2. OBJECTIVES:

The objectives of the study are as follows.

- To study the effect of Game Resource Development Programme, Transactive Learning and their interaction on Creative Problem Solving by considering Pre-Creative Problem Solving as covariate.
- To study the Change in Reaction towards Game Resource Development Programme (GRDP) amongst teacher trainees treated through treatment.

3. METHODOLOGY :

The study is experimental in nature based Non Equivalent Control Group design. The study comprised of one randomly selected 89 under graduate teacher institute. From this 42 under graduate teacher trainees willing to participate were the experimental group whereas the 47 teacher trainees of the other unit from same institute were the control group.

The experiments initiate with pre testing of creative problem solving. These were carried out by administration of Passi-Usha test of creative problem solving. The pre testing of creative problem solving is followed by phase one. Phase one included briefing of game designing programme. Throughout the program the control group continued with class room activities.

The phase two included four cycle of treatment. The treatment was given to the experimental (GRDP) group. Primly groups were formed then steps of process analysis, Imaging and Designing were taken up. After the designing the game the second cycle of treatment was taken up this sub phase included revision feedback and design improvisation. Thereafter the completion of first and second cycle of the treatment pre testing of reaction towards game designing programme was carried out. Next third and fourth cycle of treatment was carried out. In this cycle the group member was paired. The treatment followed up the steps of first cycle in which facility of three tools; facility of game designing on topic of their choice was given. The fourth cycle followed the third cycle of treatment. In the fourth cycle facility of their tools was given. The fourth cycle could be finished in 7 hours. The treatment followed the steps of second cycle. After the conduction of second phase the post test of reaction towards game designing programme was carried out by administration of GRDP inventory. This testing took 35 minutes at this time the control groups continue with normal activity of the class room.

Next, post-test of creative problem solving was carried out was administration of Passi-Usha test of creative problem solving to GRDP as well as Control group on alternate days. Next assessment of transactive learning and post test of reaction towards GRDP was initiated followed by data collection and its analyses. The analyses, finding with discussion are as follows.

4. FINDING & DISCUSSION:

4.1 EFFECT OF TREATMENT, TRANSACTIVE LEARNING AND THEIR INTRACTION ON CREATIVE PROBLEM SOLVING BY TAKING PRE CREATIVE PROBLEM SOLVING AS COVARIATE

The first objective is to study the effect of Treatment, transactive learning & their interaction on Creative Problem Solving by taking Pre Creative Problem Solving as covariate. The two levels of treatment were, Game Designing, Strategy and Conventional method. On the basis of Transactive learning, the subjects are divided into two levels namely high and low transactive learning. Thus the data were analyzed with the help of 2x2 factorial design ANCOVA. The result obtained is given in Table 1.

Table 1. Summary of 2x2 Factorial design ANCOVA for Creative Problem Solving in reference to Transactive Learning N=89

Source of Variance	df	SS _{x,y}	MSS _{x,y}	F _{x,y}
Treatment (a)	1	615.833	615.833	258.527**
Transactive learning (b)	1	25.167	25.167	10.565**
A x B	1	62.496	62.496	26.236**
Error	84	200.99	2.382	
Total	89	9196.00		

**Significant at .01 level

4.1.1 Effect of Treatment on Creative Problem Solving by taking Pre Creative Solving as Covariate

Form table 1. It can be seen that the F value for treatment is 258.527 which is significant at .01 level with df=1/84 when pre creative problem solving is taken as covariate. It indicates that the mean score of creative problem solving of learners trained during Game Resource Development Programme is found to be significantly superior than their counterpart, the Control group when pre creative problem solving is taken as covariate. In the light of this, the null hypothesis that there is no significant effect of Treatment on Creative Problem Solving when Pre Creative Problem Solving is taken a covariate is rejected. Further, the mean score of creative problem solving

of GRDP group is found to be 505.843. Which is significantly higher than those of Control Group whose mean score of Creative Problem Solving is 615.833. From here it may be said that Game Designing Strategy is found to be superior than Conventional Method when Pre Creative Problem Solving is taken as covariate.

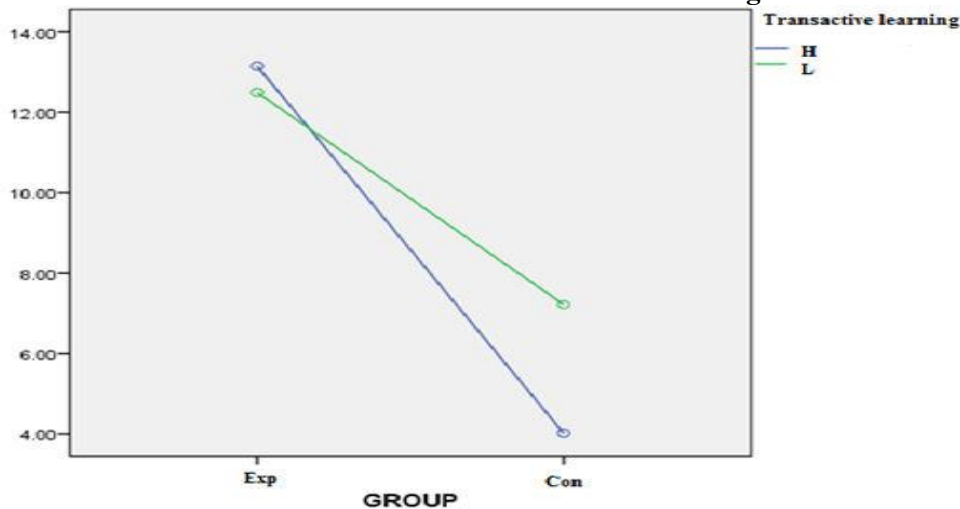
4.1.2. Effect of Transactive Learning on Creative Problem Solving by taking Pre Creative Problem Solving as Covariate

The F-value of Transactive learning is found to be 10.565 (vide table 1) which is significant at .01 level with $df=1/84$. It shows that the mean scores of Creative Problem Solving of teacher trainees possessing to high transactive learning and low transactive learning differ significantly. So there is significant effect of Transactive learning on the Creative Problem Solving of teacher trainees when Pre Creative Solving is taken as covariate. In the light of this the null hypothesis that there is no significant effect of Transactive learning on Creative Problem Solving amongst teacher trainees when Pre Creative Problem Solving is considered as covariate, is rejected. Thus, the Game Designing Programme is found to be effective on Creative Problem Solving when Pre Creative Problem Solving is considered as covariate.

4.1.3. Effect of Interaction between Treatment and Transactive Learning on Creative Problem Solving by taking Pre Creative Problem Solving as covariate

The F- value for interaction between Treatment and Transactive Learning is found to be 26.236 (vide table 1.) which is significant at 0.1 level with $df=1/84$. It indicates that there is a significant effect of the resultant of interaction between treatment and transactive learning on creative problem solving of teacher trainees when pre-creative problem solving is taken as covariate. In light of this, the null hypothesis that there is no significant effect of interaction between Treatment and transactive learning on creative problem solving amongst teacher trainees when pre creative problem solving is taken as covariate is rejected. It may therefore be concluded that Creative Problem Solving is found to be dependent on the interaction between Treatment and Transactive Learning when Pre Creative Problem Solving is taken as covariate. The same is project through Graph 1.

Graph 1: Effect of Interaction between Treatment and Transactive Learning on Creative Problem Solving



From Graph 1 it can be seen that GRDP group possess the higher creative problem solving as compared to Conventional method group. Further, the post test score of creative problem solving of GRDP group are higher than the pre test scores on the hand the pre and post test score of conventional method group were found to possess creative problem solving to the same extent. There was significant effect of the resultant of interaction between Treatment and Transactive learning.

4.2 CHANGE IN REACTION TOWARDS GAME DESIGNING STRATEGY (GRDP)

The second objective was to study the change in reaction toward GRDP amongst teacher trainees. The reaction towards GRDP was studied on administration of GRDP Reaction Scale. The participants of experimental group were pre and post tested by GRDP Reaction Scale. It means the participants were assessed during the treatment and at the end of experiment. The data in respect to reaction towards GRDP were analyzed through co-related t-test. The result is presented in Table 2.

Table 2. Mean, SD and correlated t-value for change in Reaction towards Game Resource Development Programme (GRDP) N=42 df1/41

Testing	Mean	S.D	t-value
Pre Test	84.69	8.981	

Post Test	113.62	8.401	17.211**
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**Significant at 0.01 level

From the table 2, it can be seen that the co-related t-value is 17.211 which is significant at 0.01 level with $df=1/41$ It indicates that the mean score of reaction toward GRDP assessed at two point of treatment differ significantly, which indicates that there has been significance change in reaction towards GRDP before and after the treatment. Thus in the light of this the null hypothesis that there is no significant difference in change in reaction towards Game Resource Development Programme before & at the end of the treatment, is rejected. From the mean score of reaction it can be said that teacher trainees expressed favourable reaction in the end of the treatment as compared to earlier period of the treatment.

5. CONCLUSION:

There was significant effect of the resultant of interaction between Treatment and Transactive learning. As well as the teacher trainees appreciated the Game Resource Development Programme. This study can inspire the teachers as well as the teacher trainees to adopt the design of game to inculcate the concept or the content of any subject. Further this paper also highlights the need for more of such research to be taken up in other disciplines.

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