

Effect of Token Economy and Response Cost On Learning Vocational Skills Among Adults with Intellectual Disability

M. Sarada*

Department of Special Education, National Institute for the Empowerment of Persons with Intellectual Disabilities, Secunderabad, India

Abstract: The present study was designed to find out the “Effect of Token Economy and Response Cost on Learning Vocational Skills among adults with Intellectual Disability”. Pre and post-test, Control Group design was used in the study. The Sample was drawn from Swayamkrushi Special School at Secunderabad. Pre-requisites checklist for selection of the sample and Vocational Skills checklist for the assessment of performance of the subjects were prepared by researcher. A total of 150 sessions were carried out for two Experimental Groups and Control Group Each group consisted of 25 sessions. Data analysis was done by using Paired t-test to find out the significant difference in Pre and post test of Individual group. Independent t-test was done to find out significant difference among post scores of Experimental groups and Control Group. The result of the present study indicates that, the subjects of both the groups (E1, E2) have shown significant achievement in learning Vocational Skills. Token economy and Response cost techniques were showed similar effects on learning vocational skills. There is no significant difference between the two groups (E1, E2). But it was observed that the subjects of two Experimental groups have shown faster learning than the subjects in Control group.

Keywords: Intellectual disability, adults with Mild ID, adults with Moderate ID, Vocational skills, Token Economy, Response Cost.

1. Introduction

Persons with intellectual disability have a condition of arrested or incomplete development of mind, which is especially characterized by sub-normal intelligence, thus partially or totally restricting the person's ability to perform certain activities in their life. This is owing to impairment in cognitive, emotional or behavior endowment. Intellectual disability may be defined as the product of interaction between a person skills and the demands of his or her environment (Luckasson et.al; 2002).

Much research efforts have already been made and still continuing with rapid speed to establish effective ways of teaching/training the persons with intellectual disability. The Teaching Techniques are effectively used for Training the Intellectual Disabilities in Sensory motor skills, Self help skills, Social skills, Communication skills, and Prevocational or

Vocational skills. People with an intellectual disability are capable of learning however their learning is highly dependent on the competence and quality of instruction. The persons learning will often take longer and require systematic teaching methods and extra help. Special education classrooms use some sort of individualized or group oriented token economy to manage academic and social behaviors and to prepare students for more natural settings. A token economy is a contingency management system that allows students to earn tokens that can be exchanged at a later time for specific back up reinforcers. Vocational skills for adults with Intellectual Disability are very much needed to enhance their ability to come up of any trade or occupation. The activity for intellectual disability can be trained through appropriate and systematic techniques. Token economy is widely used by increasing the production at sheltered employment. Response cost technique also used to increase work behavior among the Individuals with Intellectual Disability

Vocational training is given to an individual in order to give them the knowledge for selecting his or her occupation which would help them to earn for living their life. In order live independently, children with special needs should need a vocational training as that would help them to learn and apply their problem learning skills to their chosen vocations. Teachers and parents utilize response cost procedures effectively for decreasing undesirable behaviors and in encouraging skills. The tokens were withdrawn as consequences which were exchanged for a variety back up reinforcers such as activities, extra time for play and outdoor activities. In general research studies on measuring the effect of response cost in learning among children's with intellectual disability showed positive results. Austo (1982) described vocational programs as focusing on the development of basic academic skills, good work habits, personally meaningful work values, self-understanding and identification of preferences, skills and aptitudes, occupational opportunities, the ability to plan and make career decisions, and the locating and securing of employment.

The purpose of the present study is to investigate the effect

*Corresponding author: sarada37.bollipo@gmail.com

of token economy and response cost in enhancing learning vocational skills among adults with intellectual disability. It was provide in the research studies that the effects of token economy and response cost technique are successful in teaching different skills and reduce undesirable behavior of children's with intellectual disability and other groups. Further the majority of research studies have conducted on effectiveness of token economy and response cost on disruptive behavior of persons with mental retardation but not in terms of vocational skills. For anyone, the ultimate aim of education and rehabilitation is to lead towards economic independence. The curricular focus from childhood to adulthood includes personal adequacy social competence and economic independence. Therefore, vocational training and employment gained importance. Token economy and Response cost techniques can be used by teachers and other professionals in teaching any skills and can employ in various educational settings. Vocational instructors can use these techniques to motivate the adults with intellectual disability during vocational training and can increase production. Various employment agencies can use these techniques to increase work behavior among workers, especially in adults with intellectual disability because of their deficits in adaptive behavior and low motivation level. However, the focus of the present study is measuring the effect of token economy and response cost techniques in enhancing learning vocational skills among adults with intellectual disability.

2. Objectives of the Study

1. To find out the achievement of vocational skills among adults with intellectual disability who receive intervention through Token economy (E-1)
2. To find out the achievement of vocational skills among adults with intellectual disability who receive intervention through Response cost (E-2)
3. To find out the achievement of vocational skills among adults with intellectual disability who receive instruction through Conventional method (C)
4. To compare the achievement of vocational skills among the three groups (E1, E2, & C)
5. To compare the achievement on vocational skills with respect to severity level in each experimental group.
6. To compare the achievement on vocational skills among the three groups with respect to severity level.

3. Method

A. Design

The research design that is followed in the present study is an "experimental study". Experimental method is a systematic and scientific approach to research in which the researcher manipulates one or more variables, and controls and measures any change in other variables (Koul, 1984). In the present study Pre-test and Post-test Control group design was used to find out the effectiveness of Token Economy and Response Cost on Learning Vocational Skills among adults with Intellectual Disability.

B. Sample

Sample for the present study was adults with Mild and Moderate Intellectual Disability within the age group of 18-25 years, attending Vocational Rehabilitation Center. Non-probability sampling technique of purposive sampling was used. Purposive sample is more commonly known as judgmental sampling. It is the process of selecting a sample that is believed to be representative of a given population (Gay, 2009). The size of the sample consists of 30 adults with mild and moderate intellectual disability. The Checklist for assessing Pre-requisites Skills on Vocational Skills developed by the researcher was administered on adults with Intellectual Disability, and who has met the required criteria sample was selected. The selected-Subjects were randomly assigned to Experimental Group-I (Token Economy), Experimental Group-II (Response Cost) and Control Group.

C. Tool

The following assessment tools were developed for collecting the data.

1) Checklist for assessment of pre-requisite skills for selection of vocational skills

It was developed to find out the pre-requisites skills required for vocational skills among the adults with intellectual disability. Based on performance in the pre-requisites checklist, the vocational activity has been selected. The items in the checklist were arranged from simple to complex in logical sequence. A provision for recording the performance of the adults with intellectual disability was made in the checklist. The scoring for checklist "Assessment of pre requisites skills for selecting vocational skill" was done using numerical codes ranging from 0-5. Independent is given a code of verbal prompt as -4, gestural prompt as - 4, modeling prompt as -3, physical prompt as -1, dependent as -0. The maximum score in checklist -425 and minimum score is 85.

2) Intervention Checklist for assessing performance of vocational skills

The validated pre-requisites skills checklist was administered on the adults with mild and moderate intellectual disability. Based on the performance of adults with mild and moderate intellectual disability in the pre requisites skills checklist vocational activities were selected. To assess the performance of subjects on learning vocational skills the researcher developed two checklists on following vocational tasks:

Table 1
Lists of vocational tasks selected for adults with intellectual disabilities

S. no.	Level of retardation	tasks
1	Mild	Paper-bag making
2	moderate	Pot-painting

The above table indicating that the vocational tasks selected for adults with Mild and Moderate intellectual disabilities for the intervention.

Format is designed in such a way; there is a provision for recording the baseline assessment and periodical evaluation, which tells us of the subjects. The codes used for recording the performance of the subjects. The following keys used are

Independent (ID), Verbal Prompt (VP), Gestural Prompt (GP), Modeling Prompt (MP) and Dependent (D). The scoring for checklists “assessment of performance and evaluation of vocational skills” was done using numerical codes ranging from 0-5. Independent is given a score of 5, verbal prompt as-4, gestural prompt -4, modeling prompt as-3, physical prompt as-1, and dependent as-0. The maximum score in paper-bag checklist is 195 and minimum score is 39. And for pot-painting checklist the maximum score is 165 and minimum score is 33. Pilot study has been conducted for the checklists, also validity and reliability have been found out.

D. Procedure

Before conduction of the experiment, the written permission was obtained from the parents of subjects and the principal of swayamkrushi special school, to safeguard ethics of conducting research with human subjects. The primary objective of the study was to investigate the effect of treatment conditions on the experimental tasks across the level of retardation. In the following the experiment was carried out.

1) Setting

The experiment was conducted at swayamkrushi special school. Separate classrooms were allocated for each group. And the sitting arrangement was done on the floor.

2) Sessions

A total of 150 sessions were carried out. Each group consisted of 25 sessions. The duration of each session was 30 minutes out of that 25 minutes was intervention and remaining 5minutes was used for evaluation. Weekly 5 sessions were conducted for each group. The daily performance of the subjects was recorded on the performance sheet.

4. Statistical Analysis

Means and SD were calculated to find out the achievement on vocational skills. A Paired & Independent t- test was calculated to find out the significant difference of the mean achievement scores. To find statistical significant difference between the groups and within the groups ANOVA was

calculated. Level of significance was set as $p < 0.05$.

5. Results and Discussion

The above table shows the pre-test and post-test mean scores on vocational skills. The pre-test mean scores in overall is 49.9 and post-test mean score is 92.9. The pre-test mean score in adults with mild intellectual disabilities is 45.7 and post- test is 93.1. In the adults with moderate intellectual disabilities the pre-test mean score is 54.1 and post-test score is 92.8. to find out whether there is any significance difference between pre-test and post-test mean scores of adults with intellectual disabilities a paired t-test was calculated. The calculated t- value is 29.6 which are found to be higher than the table value indicating highly significance at 0.01 levels. The t-value of adults with mild and moderate intellectual disabilities was also found to be highly significant difference at 0.01 levels. Hence the hypothesis that there will be a significant difference in pre-test and post-test mean scores on vocational skills among adults with intellectual disability is not rejected.

From the table, it is observed that the pre-test mean scores in overall is 49.2 and post test score is 93.4. Mean achievement scores in the pre-test for adults with mild intellectual disabilities is 44.6 and the post test mean achievement score is 91.3. And for Moderate intellectual disabilities the pre test score is 53.8 and the post test mean score is 95.5 this indicates that there is a difference between pre and post test mean scores. A high improvement is found in the subjects on vocational skills taught through Response cost. However, to find out whether there is any significant difference between pre and post-test mean scores of adults with intellectual disabilities a paired t-test was calculated. The calculated t- value for Experimental Group -1 is 57.7. which is found to be higher than the table value indicating highly significant at 0.01 levels. The t-value of adults with mild and moderate intellectual disabilities also found to be highly significance difference at 0.01 level. Hence the hypothesis that there will be a significant difference in pre-test and post-test mean scores on vocational skills among adults with intellectual disabilities is not rejected.

Table 1
Comparison of Pre and Post Test Mean Scores of Experimental group-1

Level of ID	N	Pre-Test		Post-Test		t- value
		Mean	SD	Mean	SD	
Mild	5	45.7	0.43	93.1	0.78	t=123.4**, df=4, P<0.01
Moderate	5	54.1	0.51	92.8	0.51	t=116.8**, df=4, P<0.01
Overall	10	49.9	0.47	92.9	0.64	t=29.6**, df=8, P<0.01

Table 2
Comparison of Pre and Post Test Mean Scores of Experimental group-2

Level of ID	N	Pre-Test		Post-Test		t- value
		Mean	SD	Mean	SD	
Mild	5	44.6	0.61	91.3	0.92	t=93.8**, df=4, P<0.01
Moderate	5	53.8	0.46	95.5	0.69	t=114.0**, df=4, P<0.01
Overall	10	49.2	0.58	93.4	0.71	t=57.7**, df=8, P<0.01

Table 3
Comparison of Pre and Post test Mean Scores of Control group

Level of ID	N	Pre-Test		Post-Test		t- value
		Mean	SD	Mean	SD	
Mild	5	43.2	0.82	77.3	0.84	t=70.66**, df=4, P<0.01
Moderate	5	52.9	0.86	82.5	0.79	t=74.314**, df=4, P<0.01
Overall	10	48.1	0.84	79.9	0.85	t=51.2**, df=8, P<0.01

Comparison on the achievement of vocational skills among the three groups (E1, E2, &C)

Table 4
Mean and SD for Post-Scores on vocational skills of Groups (E-1, E- 2, and C)

Group	N	Mean	SD
E-1	10	92.99	0.78
E-2	10	93.45	0.92
C	10	88.79	0.84

Table 5
Summary of one way analysis of Variance for Post-Scores on vocational Skills of Groups (E1, E2, and C)

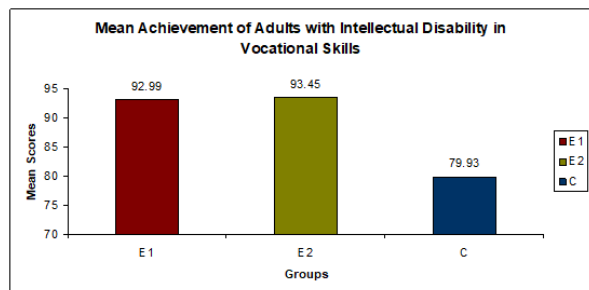
Source of Variations	Sum of squares	df	Mean Square	F- ratio
Between the groups	1176.73	2	588.37	127.26**
Within the groups	124.83	27	4.62	P<0.01
Total	1301.57	29		

Table 6
Fisher’s Least Significant Difference test for difference in Pairs of Means of achievements among the groups with respect to Severity level

Group	Mean difference	Significance
E1- E2	0.4615	0.63, P>0.05 NS
E1- C	13.0490	0.000**, P<0.01
E2-C	13.5105	0.000**, P<0.01

It is observed from the above table that there is a difference in the pre to post mean scores in overall and among adults with mild and moderate intellectual disabilities. Further to see the difference between mean scores of pre and post a paired t test was calculated for control group. The calculated t value is 51.2 which indicate highly significant at 0.01 levels. The t-value of adults with mild and moderate intellectual disability also found to be highly significance difference at 0.01 level. Hence the hypothesis that there will be a significant difference in pre-test and post-test mean scores on vocational skills among adults with intellectual disabilities is not rejected.

The above table shows the post-mean scores on vocational skills of adults with mild and moderate intellectual disability in experimental group-1, experimental-group 2 and control group. The subjects in the experimentalgroup-2 have shown little higher achievement (93.45) than subjects in Experimental group-1(92.99), but higher achievement difference when compared with subjects in control group (77.3) on vocational skills. Hence Experimental group-2 who received response cost indicating that more achievement than other two groups (E1 and C) on vocational skills.



In ordered to find any significant difference among the three groups one-way analysis of variance (ANOVA) was done. The results are shown in the table.

From the entries given in table 8, the results indicate that the F-ratio is 127.26 which is highly significant at 0.01 level. Hence the hypothesis that there will be a significant difference among the three groups (Exp-1, Exp-2 and Control Group) is

not rejected. Further to find out which pair of treatments means significantly differ, Fisher’s least significance difference test was done. The results are summarized in the table 6.

The above table shows the pair wise comparisons of three groups (E1, E2 and C). E1 is the Experimental group-1(token economy), E2 is the Experimental group 2(response cost) and C is the control group. The above table indicates that there is no significant difference between E1 and E2.

6. Conclusion

The results indicate that both token economy and response cost were effective on learning vocational skills. Today, token systems are used in most special education self-contained classes and resource rooms (Buisson, Murdock, Reynolds, and Cronin, 1995) Tokens are used by teachers and Para professionals when teaching specific academic skills and many general education classes (Carpenter, Zool, Mc Ginny’s, Friman, and Carlyon 1991). Vocational training instructors should use token economy and response cost procedures to improve the work behavior of the adults with intellectual disability and can increase production in vocational units. Token economy and response cost programs are found to be useful while rewarding the children in groups. Limitation of the present study is the period for collecting the data was short, as we are dealing with Students with Intellectual Disability they require more time to get accustomed to new things, as far as this intervention results are concerned they showed significant improvement on learning vocational skills. However better and reliable results can be obtained if the study is conducted for a longer period of time. The present study revealed that, Token economy and Response cost are more effective on learning vocational skills. Combination of token economy and response cost procedures can be used in class room teaching so there is a need to conduct research on the combination of token economy and response cost procedures on different skills.

The result of the present study indicates that, the subjects of both the groups (E1, E2) have shown significant achievement in learning Vocational Skills. Token economy and Response

cost techniques were showed similar effects on learning vocational skills. There is no significant difference between the two groups (E1, E2). But it was observed that the subjects of two Experimental groups have shown faster learning than the subjects in Control group. Findings of the present study proved that token economy and response cost can be used to teach vocational skills to adults with intellectual disability. Vocational training provides the opportunity to Adults with Intellectual Disability to become more Independent and socially competent in community living. Achieving employment out comes for adults with Intellectual Disability are a complicated process and requires more than just teaching. Token economy and response cost are techniques which are helpful in Training and Education of Adults with Intellectual Disability.

References

- [1] Austo, T.A. Vocational education programs and services for high school handicapped students. Bloomington: Council of Administrators of special education, Indiana University, 1982.
- [2] Alberto, P.A., & Troutman, A. C. Applied Behavior Analysis for Teachers, New jersey, Pearson Education, Inc., Upper Saddle River, 2003.
- [3] Buisson, G., M, J, Reynolds, K., & Cronin, M, Effects of tokens on response latency of students with hearing impairment in a resource room. Education and Treatment of children, 1995,18(4),408-421.
- [4] Carpenter, L.B. Utilizing travel cards to increase productive student behavior, teacher collaboration, training in Mental Retardation and Developmental Disabilities, 2001, 36, p, 318-322.
- [5] Center, D. B & Wascom, A. M Transfer of reinforcers: A Procedure to enhance Response Cost, Educational and Psychological Research, vol.4, no. 1, 1984.
- [6] Gay, L. R., Millis, G.E., Airsian, P. Educational Research. New jersey: Library of Congress Cataloging in publication data. .2009.
- [7] Holciombe, A., Wolery, M., Werts, M., & Hrenkovich. P. Effects of instructive feedback on future learning. Journal of Behavioral Education, 1993, vol. 3, no. 3, pp. 259-285.
- [8] Iwata, B.A., & Balley, J.S. Reward versus cost token systems: An Analysis of the Effects on Students and Teacher. Journal of Applied Behaviour Analysis, 1974, vol. 7, no. 4, pp. 567-576.
- [9] Koul, L. Methodology of educational Research, Vikas Publication House Private Limited, New Delhi, 1984, 15-16.
- [10] Luckasson, et. al., Mental Retardation: Definition, Classification, and systems of supports (10th edition). Washington, American Association on Mental Retardation, 2002.
- [11] Lynch, E. W. Exceptional children and adults; An introduction to Special education. Library of congress cataloging, 1988, pp.105-109.
- [12] Robinson, P. W. & Newby, T. J. et.al. A token system for an underachieving hyperactive children. Journal of applied behavior analysis, 1981, vol. 14, pp. 307-315
- [13] Walker, H. M. Application of response cost in School Settings: Outcomes, Issues and Recommendations. Exceptional Education Quarterly, 1983, pp.47-55
- [14] Wehman, P. Editorial, Journal of Vocational Rehabilitation, 1997, 9,93-94.
- [15] Zimmerman, et.al. The Effects of Token Reinforcement on the Productivity of Moderately Retarded Clients in a Sheltered Workshop. British journal of mental retardation, 1969, vol.19, pp. 80-4.