APPLICATION OF KIRKPATRICK MODEL USING T –TEST: CASE STUDY OF A WORKSHOP TRAINING PROGRAM

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ABSTRACT

We are at the beginning phase of 4th Industrial Revolution. The importance of artificial intelligence is increasing in the decision making but the role of human capital cannot be ignored. Human capital formation can be done by training program at educational institutions. The success of organization depends upon quality manpower and the success of training program depends upon the evaluation of training program results. In contemporary times the biggest challenge is to identify which outcomes, benefits, or final results are most closely linked to the training, and to come up with an effective way to measure these outcomes in the long term. The current paper has applied "Kirkpatrick Model" to measure the effectiveness of workshop training program at BCA Lab of R.D. & D.J. College, Munger. A sample of 10 participants was analyzed out of 75 participants at the end of the workshop session to measure the effectiveness of training program. Therefore, paired t-Test was applied as a statistical tool to analyze the pre and post data. If t- Stat (calculated) value is more than Critical one - tail (Tabular) value then training program is considered as effective. The main finding of the paper is that workshop training program conducted was effective. This training program can be used as benchmarking for other educational institutions not only in Bihar but it can be also applicable for other states of India.

Keywords: *4th Industrial Revolution, Kirkpatrick Model, Paired t-Test, Benchmarking.*

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Introduction

A workshop on '**Applications of Computer in Commerce**' for Research scholars, P.G. and U.G. students was organized by R.D. & D.J. College (Commerce Department and B.C.A Department in association with I.C.A. Edu Skills Private Limited, Kolkata and its Bhagalpur Branch) under aegis of **Industry –Academia** interface. This workshop covered different inter-disciplinary topics such as evaluation of Risk and Return, capital budgeting using spreadsheets, and evaluation of training program in an organization using Advance Excel. A vocational training was provided in a small group of participants.The objective of this workshop was to cater the dynamic needs of academia, industry & society. This workshop would be helpful to develop the soft skills among students for present and future industry needs. A vocational training through workshop strived to fulfill the gap between industry and academia.

R.D & D.J. College is a NAAC accredited college in the historical town of Munger, known as 'Anga' in ancient times. It is providing education to the students of Arts, Science & Commerce discipline. In 2012 Bihar Government awarded "The Centre of Excellence" to the college.

Literature Review

Donald Kirkpatrick, former Professor retired from the University of Wisconsin, first published his model in 1959. He updated it in 1975, and again in 1993, when he published his best-known work, "Evaluating Training Programs". Each successive level of the model represents a more precise measure of the effectiveness of a training program. It was developed further by Donald and his son, James; and then by James and his wife, Wendy Kayser Kirkpatrick. In 2016, James and Wendy revised and clarified the original theory, and introduced the "New World Kirkpatrick Model" in their book, "Four Levels of Training Evaluation." One of the main additions is an emphasis on the importance of making training relevant to people's everyday jobs.

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The four levels are **Reaction, Learning, Behavior,** and **Results**.

4th Level is likely to be the most costly and time-consuming. At this level, we analyze the final results of training.Our biggest challenge is to identify which outcomes, benefits, or final results are most closely linked to the training, and to come up with an effective way to measure these outcomes in the long term.Modern trainers often use the Kirkpatrick model backward, by first stating the results that they want to see, and then developing the training that is most likely to deliver them. This helps to prioritize the goals of the training and make it more effective. Followings are the research objectives:

- To know the compositions of participants of workshop training program.
- To measure the effectiveness of workshop training program.

Research Methodology

This study relates to **Descriptive Research Design**. For this study primary data has been gathered from workshop training program organized at BCA Lab of R.D. & D.J. College, Munger University, Munger on September 16, 2019. In the present paper various Statistical tools such as bar diagram, Circular Diagram, Average, Standard Deviation, and Coefficient of variation and paired t-Test have been used.

The present paper studies the effectiveness of workshop training program by analyzing pre and post results of the participants based on the MCQ questions related to the training program. Separate question papers were designed for two separate tests i.e. pre and post evaluation of the performance of the participants. There were 10 questions in each test. As a technique of research, same questions were asked by changing only serial number in each test. The data of 75 participants were analyzed to know the composition of the participants of the workshop training program. A sample of 10 participants was analyzed at the end of the workshop session to measure the effectiveness of training program. Therefore paired t-Test was applied to analyze the pre and post data (**before- after, n<30**). It is our assumption that there is normal distribution. The significance level for hypothesis testing is assumed at 5%. The hypothesis of the present research paper is as follows:

Null Hypothesis (Ho): There is no significant difference of training program

Alternate Hypothesis (H1): There is significant difference of training program

Result and Discussion

Our **first objective** is to know the compositions of participants of workshop training program.

Let us discuss the gender composition of workshop training program with the help of bar diagram based on primary data collected during different sessions of the workshop training program.
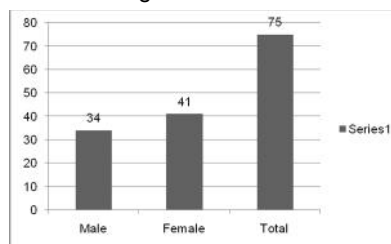
Figure 1: Gender Composition of Workshop Training program

It is clear from above bar diagram that female participation was greater than male participation.

The compositions of different educational background of participants are depicted with the help of circular diagram:
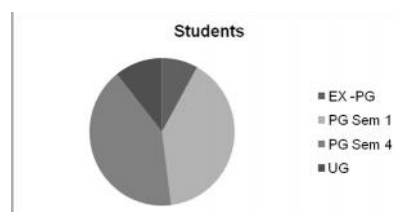
Figure 2: composition of Educational Background of Participants

It is found that PG student's participation was greater than UG students and research scholars (Ex- PG).

The participation of students from different colleges are presented with the help of bar diagram
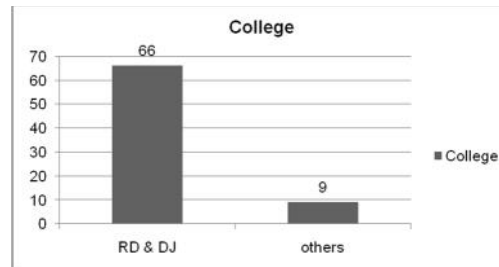
Figure 3: Participation of Students from colleges

In above bar diagram, it is clear that most of the participants were from R.D. & D.J. College. Other include PG department of TMBU, Koshi College Khagaria, BRM College etc.

Our **second objective** is to measure the effectiveness of workshop training program.

We have used paired t- Test to measure the effectiveness of workshop training program as a statistical tool. Pre and post tests were conducted at the beginning and at the end of the workshop training program. The results of 10 participants were selected on random sampling basis. The data analysis results are given below using advance Excel:

Table 1: t-Test Paired Two Sample for Means

	Variable 1	Variable 2
Mean	14.4	10.4
Variance	22.93333333	16.48888889
Standard Deviation	4.788875999	4.060651289
Coefficient of Variation	20.88172674	24.62659137
Observations	10	10
Pearson Correlation	0.859361789	
Hypothesized Mean Difference	0	
df	9	
t Stat	**5.163977795**	
P(T<=t) one-tail	0.000295962	
t Critical one-tail	**1.833112923**	
P(T<=t) two-tail	0.000591925	
t Critical two-tail	2.262157158	

Our result says that Null Hypothesis is not accepted because t Stat (calculated) value is more than Critical one - tail (Tabular) value. We conclude that workshop training program conducted was effective. This training program can be used as benchmarking for other educational institutions in Bihar.

Limitation and Further Research

The present research paper studied only one workshop training program at educational institution. The research period is restricted to short span of time. The scope of study can be extended to other educational institutions.

Conclusion and Suggestions

The importance of artificial intelligence is increasing after 4^{th}Industrial Revolution in the decision making. The role of human capital cannot be ignored. In contemporary times the biggest challenge is to identify which outcomes, benefits, or final results are most closely linked to the training, and to come up with an effective way to measure these outcomes in the long term. The current paper has applied "Kirkpatrick Model" to measure the effectiveness of workshop training program. The main finding of the paper is that workshop training program conducted was effective. This training program can be used as benchmarking for other educational institutions not only in Bihar but it can be also applicable for other states of India. This research paper can be used for policy making by the State Govt. and their universities. This paper can provide insights to the trainers/resource persons of any workshop training program.

References

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¤   http://www.kirkpatrickpartners.com
¤   http://www.mhhe.com/aswathappa8e

Appendix

Appendix Table 1: Test Score, pre & post

S. No.	Score before Workshop	Score after Workshop
1	8	8
2	*12*	*18*
3	16	18
4	14	18
5	12	18
6	5	8
7	12	14
8	5	8
9	14	20
10	6	14

MCQ Questions for pre test

Solve these questions before workshop

Name: **College:**

1.   Which type of training is required to fulfil the gap between industry Academy interfaces?
    (a)   Vocational training   (c) All of above
    (b)   Workshop training   (d) None of above

2.   Which type of software used for research work?
    (a)   Advanced Excel only   (c) SAS only
    (b)   SPSS only   (d) All of above

3.   Risk and return are fundamental of...........
    (a)   Investment   (c) All of above
    (b)   Depreciation   (d) None of above

4.   Which model is used for measuring effectiveness of training?
    (a)   Kirkpatrick model   (c) All of above
    (b)   Regression model   (d) None of above

5.   Which test is appropriate when n is less than 30?
    (a)   t- test   (c) All of above
    (b)   z- test   (d) None of above

6.   If beta is positive then which period is good for investment?
    (a)   Boom   (c) All of above
    (b)   Recession   (d) None of above

7.   What does r square mean?
    (a)   Explained variation   (c) All of above
    (b)   Unexplained variation   (d) None of above

8.   Alpha measures the..............
    (a)   Intercept   (c) All of above
    (b)   Slope   (d) None of above

9. Which type of Intelligence is required after 4th industrial revolution?
   (a) Artificial intelligence only   (c) All of above
   (b) Collaborative intelligence   (d) None of above
10. If NPV is positive then project is
   (a) Acceptable   (c) All of above
   (b) Non Acceptable   (d) None of above

MCQ Questions for post test

Solve these questions after workshop

Name: **College:**

1. Which model is used for measuring effectiveness of training?
   (a) Kirkpatrick model   (c) All of above
   (b) Regression model   (d) None of above
2. Which type of training is required to fulfil the gap between industry Academy interface?
   (a) Vocational training   (c) All of above
   (b) Workshop training   (d) None of above
3. Which test is appropriate when n is less than 30?
   (a) t- test   (c) All of above
   (b) z- test   (d) None of above
4. Which type of software used for research work?
   (a) Advanced Excel only   (c) SAS only
   (b) SPSS only   (d) All of above
5. If NPV is positive then project is
   (a) Acceptable   (c) All of above
   (b) Non Acceptable   (d) None of above
6. Alpha measures the..............
   (a) Intercept   (c) All of above
   (b) Slope   (d) None of above
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   (a) Explained variation   (c) All of above
   (b) Unexplained variation   (d) None of above
8. Which type of Intelligence is required after 4th industrial revolution?
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   (a) Artificial intelligence only   (c) All of above
   (b) Collaborative intelligence   (d) None of above

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