



## Effective Teaching Assessment Model: Utilizing the Kirkpatrick Evaluation Framework

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**Abstract:** A critical review was done to study about Kirkpatrick model of training evaluation and its operation through different papers and websites in different interval of time and in different surrounds. substantially for the composition, Google Scholar was preferred and only many of them were penetrated from Google and others. This review substantially focuses on different phases of Kirkpatrick model and the impact of each phase on trainee. Kirkpatrick Four- position training evaluation model is veritably effective way to measure how well the training performed. The model was created by Donald Kirkpatrick (1959) and after it has experienced several updates and variations. It assesses response in position 1, learning in position 2, gets in position 3 and eventually affect in position 4. On advancing from one position to other the evaluation significance also goes on adding. Indeed, though the model is extensively preferred but isn't suitable in all cases as it can be so important time and resource consuming. So one who's going to use this model should originally assess the applicability of this model at that condition and apply it, so that the anticipated ideal of training evaluation can be achieved successfully and directly.

**Index Terms -** Kirkpatrick Model, Training, Teaching Methods, Innovative Practices, Evaluation, Trainee.

### I. INTRODUCTION

Review the aforementioned cutting-edge teaching techniques and think about how you may implement them in your classroom to raise student engagement. Innovation in the classroom should constantly take into account how it might help students perform better. Promoting learning is the aim of instruction. Through Kirkpatrick we use tactics that encourage learning.

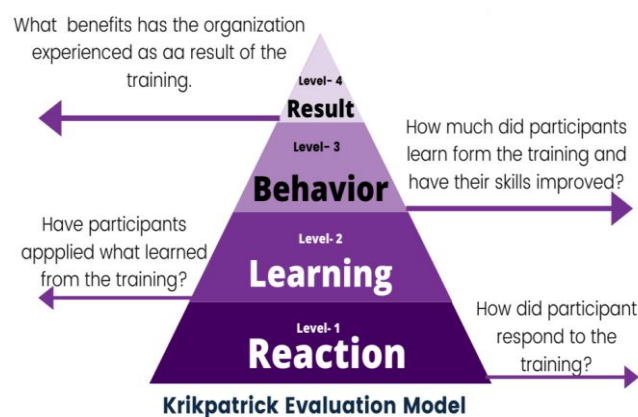


Fig 1: Kirkpatrick Evaluation Model[13]

Assessment of educational results plays an an increasing number of vital positions in better training; it has been a focus of many recent discussions within the literature in addition to in regular exercise of schools and universities. especially, accrediting organizations as well as governments area developing importance on student educational learning, which include content material gaining knowledge of and intellectual improvement, as an outcome of tutorial programs (Allen 2006; Bers 2008; Brittingham et al. 2008; Ewell 2001, 2006). in addition, the accreditors, governments and team of workers' representatives assume that establishments of higher training as it should be put together college students for the hard work pressure through development of relevant abilities and skills (Toutkoushian 2005; Voorhees and Harvey 2005). fulfillment of such results needs to be as it should be documented via the process of evaluation.

The model used to manual reviews bear a close dating to the effectiveness and software of those opinions. unavoidably there also are moral dimensions to the fashions and the ways wherein they're used. it's miles consequently essential to concern our fashions to ongoing mirrored image and analysis from distinct perspectives. Such mirrored image should assist answer a fundamental ethical question about opinions: "Are we doing the proper component, and are we doing it properly?" (Schwedt, 1998, p.11). whilst the evaluation is completed, we are able to wish that the outcomes are high quality and gratifying, each for those responsible for the program and for upper-level managers who will make selections based totally on their evaluation of this system. consequently, tons concept and making plans want to accept to this system itself to ensure that it is powerful.

Training constitutes a simple concept in human resource development. its miles worried with developing a specific skill to a preferred standard by means of instruction and practice. training is an especially beneficial tool that could deliver a worker into a position where they could do their task correctly, efficiently, and carefully. education is the act of increasing the knowledge and talent of a worker for doing a particular task.

For this assessment on Kirkpatrick version of training assessment, almost all assets of statistics have been studied. As a review this work has attempted to collect the ideas from unique articles from Google pupil, Academia, Penn State, AJAS, Semantic pupil, UNISA, research Gate and others. For the reference and citation EndNote X7 become used. The work done in many fields which includes agriculture have been studied and protected on this evaluate.

## II. KIRKPATRICK'S FOUR LEVELS OF EVALUATION

In most of the trainings, we look ahead to the very last effect or specially the trainings which are associated with the adoption of technology, we test the adoption index to peer how powerful the training became and the way powerful it is able to were. a while whilst we're giving training, we do have time to adjust our techniques and presentation to undertake what the trainee would decide upon. but generally, all through training, trainee in no way explains what manner he/she might have cherished to get hold of the training. For this the teacher should be capable of observe the trainees for the duration of the schooling and modify accordingly. For this suitable training evaluation models may be carried out. The Kirkpatrick version is probably the quality known model for analyzing and comparing the outcomes of schooling and educational programs. It takes into consideration any fashion of education, each informal and formal, to decide aptitude based totally on four degrees criteria. by means of a way the most popular approach to the evaluation of schooling in organizations nowadays is Kirkpatrick's (1976) framework of four 'ranges' of standards. according to Bates (2004) Kirkpatrick's (1976, 1994) schooling evaluation version delineates 4 levels of schooling evaluations response, getting to know, behavior, and effects. Donald Kirkpatrick, Professor Emeritus on the college of Wisconsin and past president of the Yank Society for schooling and improvement (ASTD), first posted his 4-stage schooling evaluation model in 1959, within the US education and development magazine. The model was then up to date in 1975, and once more in 1994, while he posted his exceptional-recognized paintings, "evaluating training packages."

According to (Kirkpatrick, 1975), prior training evaluation one must focus on the following things so that one can make better training evaluation:

1. Determining needs
2. Setting objectives
3. Determining subject content
4. Selecting participant
5. Determining the best schedule
6. Selecting appropriate facilities
7. Selecting appropriate instructors
8. Selecting and preparing audiovisual aids
9. Coordinating the program
10. Evaluating the program

stage 1 is reaction measures how members react to the schooling (e.g., pleasure?), stage 2 is mastering analyzes in the event that they surely understood the education (e.g., boom in information, abilities or revel in?), degree three is conduct looks as if they may be utilizing what they discovered at paintings (e.g., exchange in behaviors?), and level four is consequences determines if the fabric had a wonderful impact at the business / corporation. As mentioned by using this system, evaluation needs first of all level one, after which as time and assets will allow, should proceed in order through stages two, 3, and 4. statistics from all of the preceding levels may be used as a foundation for the subsequent tiers' analysis. As a result, every next degree affords a good extra correct size of the usefulness of the schooling route, yet concurrently calls for a significantly more time-consuming and disturbing assessment.

### 2.4 Reaction:

If the participant/Students enjoyed their experience and found the program's/Lecture's/Workshop content relevant for their work & their syllabus, these factors will be determined by the assessment questions. The term "smile sheet evaluation" is frequently used to describe this specific type of examination. This level enables us to gauge how our learners are responding to our instruction. Of course, we want them to think well of the teacher, the subject, the content, the presentation, and the setting. We also want them to think highly of the training as a valuable experience. Measuring response is crucial since it enables us to determine how effectively our trainee/Students accepted the teaching. It also enables us to identify crucial omissions or gaps in the training we provide for upcoming learners.

Table 1: Evolution tables of trainer and Students

**Trainer Evaluation**

Please check the appropriate box for the trainer's evaluation.

	Poor	Fair	Good	Excellent
1. Did your trainer have a thorough grasp of the subject?				
2. Did your trainer actively invite questions?				
3. Did your trainer answer the question posed?				
4. Was individual help provided when needed?				
5. Was your trainer prepared for class?				
6. Did your trainer have a professional demeanor?				
7. Did the trainer provide time for follow-ups?				
8. How would you rate the overall skills of the trainer?				

**Class Evaluation**

Please check the appropriate box for the overall class evaluation.

	Poor	Fair	Good	Excellent
1. Did this class meet your expectations?				
2. Was the level of instruction appropriate?				
3. Was the length appropriate?				
4. Did the class begin on time?				
5. Was all of the equipment working properly?				
6. How would you rate the manuals?				
7. Was the training facility adequate?				
8. What is your overall level of satisfaction with this training?				

According to Kirkpatrick, every training session has to be evaluated at this level in order to enhance the model for use in the future. Additionally, from the table 1 the replies of the participants are crucial in determining their degree of interest in the following level. Although a positive response does not guarantee learning, a negative one unquestionably decreases the likelihood that the user will pay attention to the instruction. (Kurt, 2014) provides the following examples of resources and level one techniques:

- An online test that delegates or evaluators can grade.
- Interviews
  - Can be conducted right after training.
  - Do the students approve of the instructor or instructors?
  - Were the participant's needs met by the training?
  - Are the attendees satisfied with the instructional methods used? (e.g., PowerPoint, handouts etc.)
  - Written or verbal reports delivered to managers at the participants' organizations by delegates or assessors.
- Smiling sheets
  - Individual responses to the training course that are subjective in nature decide comment forms.
  - Questionnaires following training sessions.
  - Verbal replies that can be taken into account and thought about.
  - Encourage written remarks in particular.

**2.1 Learning:**

At level 2, the trainee's change in knowledge level is evaluated. The measurement will start at this point. Finding the parameter that has to be examined is crucial. Measuring the change before and after the training allows for a fair comparison. Using verbal or written evaluations at the start and conclusion of the training session is a helpful technique to do this. The amount of experience, information, or mentality that participants have attained should be measured at level 2. Compared to level one, exploration at this level is far more difficult and time-consuming.

Techniques might range from casual to formal exams, as well as from self-evaluation to team evaluation. Whenever feasible, people take the test.

Examples of level two tools and processes are given by Kurt (2014). Measurement and assessment are easy and clear for any group size.

- To comparison, we may employ a control group.
- Tests, interviews, or evaluations conducted before and after the training.
- Peer and instructor observations
- Assessment strategies must be pertinent to the training program's objectives.
- To lessen the likelihood of conflicting evaluation reports, a specific, unambiguous scoring procedure has to be established.
- Examinations of the written, electronic, or interview variety may be used.
- An interview can be conducted both before and after the evaluation, but it takes time and is unreliable.

## 2.2 Behavior:

At this stage, we assess how much the instruction our students received has affected their behavior. This specifically examines how students put the knowledge to use. It's crucial to understand that behavior can only alter in favorable circumstances. Consider the scenario when we exclude the first two Kirkpatrick levels of assessment and find that there has been no change in our group's behavior. Therefore, we infer that the instruction was inefficient and that the students haven't learnt anything.

However, this does not imply that trainees have not learnt anything merely because their behavior has not altered. Perhaps their family won't allow them to use what they've learned. Or perhaps they have understood what we have taught them, but they lack the motivation to put what they have learned to use.

Examples of assessment tools and methods for level three are provided by Kurt (2014), including:

- This may be done through observations and interviews.

Until a change is discernible, evaluations must be subdued; only then can a more complete assessment tool be applied.

- Were the information and abilities employed that were acquired?
- Surveys and ongoing monitoring are required to assess if a change is substantial, how important it is, and how long it will persist.
- Integrating online assessments is typically more difficult. Exams are typically more successful when included into the participant's workplace's current management and training practices.
- Hasty tests conducted just after the programed won't be accurate since people change in different ways at different periods.
- One tool is 360-degree feedback.

## 2.3 Result:

The level that will likely cost the most money and take the longest to complete is the one where the training's ultimate outcomes are measured. Finding a reliable technique to monitor these outcomes over an extended period of time and determining which outcomes, benefits, or ultimate results are most closely related to the training are the two major hurdles. Gaining a comprehensive grasp of the training's success and identifying areas for improvement through analysis of each level is helpful. The only way to calculate the return on investment is to measure for all levels, which might take some time. Weighing the advantages and disadvantages is the first stage before developing a strategy for design, execution, and evaluation.

The results of Mind Tools (2017) lead us to the following possibilities:

- Improved staff retention.
- An increase in output.
- Improved morale.
- Less waste and higher sales.
- Better quality scores.
- Enhanced client satisfaction.
- Less employee complaints.

Although Kirkpatrick's Four-Level Training Evaluation Model by Min The trainer can assess the success of the training in an objective manner by using the Kirkpatrick Four-level Training Evaluation Model. Donald Kirkpatrick developed the concept in 1959, and since then, it has undergone a number of upgrades and adjustments. It evaluates a response at level 1, knowledge at level 2, conduct at level 3, and results at level 4. One may easily and clearly grasp the efficiency of a performed training by working their way through these four stages, and in the days to come, the trainings may be enhanced.

The model is not, however, always applicable and practical; at times, it can be quite time and resource intensive. Therefore, someone who intends to apply this paradigm should first evaluate its applicability. Mind Tools (2017) is well known and frequently utilized, there are a few things to keep in mind when applying the model. As follows:

1. Using the model's levels 3 or 4 can be costly and resource-intensive.
2. Setting up an organization to gather data only for the purpose of assessing training might be resource-intensive.
3. The model also presupposes that all levels are interconnected and that each level is more significant than the previous one. For instance, it argues that reactions must be favorable in order for learning to occur and that reactions are ultimately less significant than results. This might not actually be the case.
4. Most significantly.

## IV. RESULTS AND DISCUSSION

The Ministry of Electronics & Information Technology (MeitY) is running a Cyber Awareness Campaign, titled 'Stay Safe online campaign' in order to raise awareness among various user groups on topics, "safe use of social media platforms, informed usage of digital payment and internet during India's presidency of the G20". In view of this, we are conducting regular workshops, monthly, on cyber safety through quizzes, group discussion, etc. from December, 2022 to November, 2023. So we implement Kirkpatrick model for this course.

The Kirkpatrick Model is a widely accepted framework for evaluating the effectiveness of training and development programs. The model has four levels of evaluation, which are:

1. Level 1 - Reaction: Evaluating how participants react to the training.
2. Level 2 - Learning: Evaluating the extent to which participants acquire knowledge and skills.
3. Level 3 – Behavior: Evaluating the extent to which participants apply what they learned on the job.
4. Level 4 - Results: Evaluating the impact of the training on organizational goals.

The Implement a cybersecurity Course in the Kirkpatrick Model involves the following steps:



**4.1 Level 1 - Reaction:** We gather feedback from the participants/students to assess their reaction to the Cyber security training. This was done through Google form which has few questions about the course is conducting. The feedback can be used to improve the course content, Delivery and materials. Below is the template which was asked in google form for feedback

Table 2: Evolution tables of Students

Training Evaluation & Feedback				course title & date .....
	Great	Moderately	None	specific suggested improvements?
Enjoyment: Did I Understand the course(Topic)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Knowlegde: Faciltator knowledge?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
New knowledge and ideas: Did I learn what I needed to, and did I get some new ideas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Applying the learning: Will I use the information and ideas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Effect on results: Do I think that the ideas and information will improve my effectiveness and my results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Effectively adapt and implement their new skills.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Any other comments?				

Table 3: Evolution tables of Trainer

Trainer self Evaluation				course title & date .....
	YES	NO	specific suggested improvements?	
Did the training meet the participant's needs?	<input type="checkbox"/>	<input type="checkbox"/>		
Seek honest answers than polite ones	<input type="checkbox"/>	<input type="checkbox"/>		
Conduct pre and post-learning assessments. (quizzes and tests)	<input type="checkbox"/>	<input type="checkbox"/>		
Were the learned knowledge and gained skills used?	<input type="checkbox"/>	<input type="checkbox"/>		
Give enough time to the learners	<input type="checkbox"/>	<input type="checkbox"/>		
Allow enough time to measure / evaluate	<input type="checkbox"/>	<input type="checkbox"/>		
Any other comments?				
Name & Signature .....				

**4.2 Level 2 - Learning:** Assess the participants' knowledge and skills before and after the training to determine the effectiveness of the course in terms of learning outcomes. This can be done through quizzes, exams, or practical exercises. The results can be used to identify areas of strength and weakness in the course and adjust the content accordingly. We have conducted quiz for Cyber security course.

CyberSecurity Course Quiz

308 responses

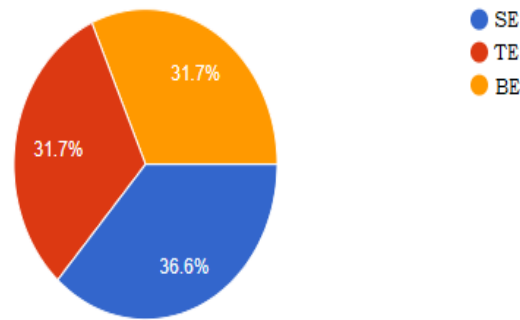


Fig 02: Quiz on Cyber Awareness Campaign on ‘Stay Safe online campaign’ responses

**4.3 Level 3 - Behavior:** Observe the participants'/Student’s behavior on the course to determine if they are applying what they learned in the course. This can be done through performance evaluations, supervisor feedback, or self-assessments. The results can be used to identify areas where additional support or coaching may be needed.

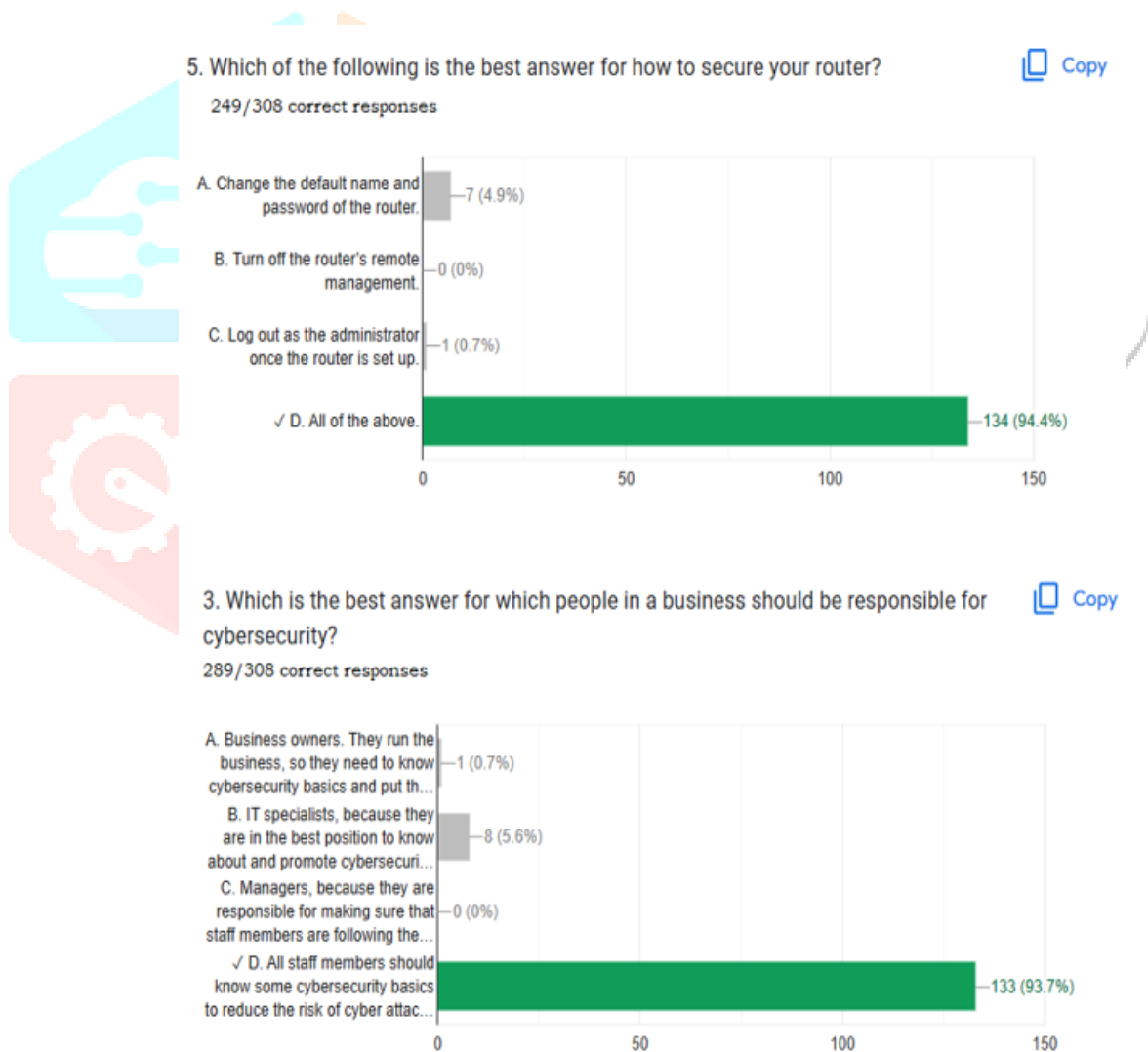


Fig 03: Evaluation of Quiz

**4.4 Level 4 - Results:** Measure the impact of the course on organizational goals, such as reducing cybersecurity incidents or improving the organization's overall security posture. This can be done through metrics, such as the number of incidents before and after the training or the overall cost savings from reducing incidents. The results can be used to demonstrate the ROI of the training and justify the investment in future cybersecurity training programs.

### III. CONCLUSION

The Kirkpatrick model is a widely used framework for evaluating the effectiveness of training programs. In his seminal paper [15], "Techniques for evaluating training programs," Donald Kirkpatrick outlines a four-level model that evaluates training programs based on their impact on learning, behavior, results, and return on investment.

At level one, the model evaluates whether the training program has successfully transferred knowledge and skills to the learners. At level two, it examines whether the learners have used the knowledge and skills acquired during the training program in their work. At level three, it evaluates the impact of the training program on the organization's performance. Finally, at level four, it assesses the financial return on investment of the training program.

The Kirkpatrick model has been widely adopted because it provides a structured approach for evaluating the effectiveness of training programs. However, critics have pointed out that the model is limited because it does not take into account the context in which the training program was implemented, nor does it consider the impact of external factors that may affect the results.

Overall, the Kirkpatrick model remains a valuable tool for evaluating training programs, but it should be used in conjunction with other evaluation methods to provide a more comprehensive picture of the program's effectiveness.

The model is not, however, always applicable and practical; at times, it can be quite time and resource intensive. Therefore, someone who intends to apply this paradigm should first evaluate its applicability. By implementing a cybersecurity course in the Kirkpatrick Model, we can ensure that the training is effective in achieving its intended goals and provides value to the organization.

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