

# A Critical Analysis of Various Evaluation Models: Step Towards Education 4.0

**Dr. Ruhi Bakhare<sup>1</sup>, Mr. Upal Sinha<sup>2</sup>**

Dr. Ambedkar Institute of Management Studies and Research, Deekshabhoomi, VIP Road, Nagpur, India

<sup>2</sup> Consultant (People Development), Nagpur, India

<sup>1</sup> ruhibakhare@rediffmail.com,

<sup>2</sup> upalsinha@gmail.com

**Abstract:** The purpose of this study is to propose an innovative model for evaluating the various higher education programs keeping in mind the National Education Policy (NEP) 2020. Since independence, there has been incredible growth in the landscape of higher education. According to the recent statistics from about 20 universities in 1950, there are now about 1040 universities. About 135 of these institutions are regarded as Institutions of National Importance (INI). From these figures, it is seen that the number of education universities and enrollment has geared up which has also given rise to the concern for quality and relevance of the education imparted. The quality of education and its relevance can be judged from the assessment and evaluation patterns. According to the New Education Policy 2020, Higher education is treated as a program as it is intended not only to impart knowledge it is also to develop certain associated skills thereby inculcating a specific type of attitude. Therefore, they should be looked at and evaluated as a training program. There are various models which are proposed by various researchers and trainers in different eras. This research paper intends to study these models in detail and tries to

propose a new evaluation model which will be a step toward Education 4.0.

**Keywords :** NEP 2020; Higher Education; Evaluation models and Education 4.0

## I. Introduction

Education 4.0: To prepare future graduates to lead a dignified and meaningful life ahead, education must get aligned with the industry and social requirements and also should align itself with the evolving fourth industrial revolution. To ensure the quality of education every professional course has to be considered as a program. The universities running these programs must have their own designed program objectives. These program objectives must have some desired outcomes and some of these outcomes are supposed to be attained with the help of activities, demonstrations, events, or workshops. The era of Education 2.0 was the time when technology started penetrating the education process, it was just the beginning when the teachers, as well as students, started using technology just at a beginner's level. Moving further Education 3.0 emerged as an advanced use of technology wherein technology became the inevitable part of education. It was the phase when the number of internet users increased drastically.

Today in the Education 4.0 era learning has to be technology-centric and the focus has to be on the

**Dr. Ruhi Bakhare**

Dr. Ambedkar Institute of Management Studies and Research,  
Deekshabhoomi, VIP Road, Nagpur, India  
ruhibakhare@rediffmail.com,

transformation of education through technology. It is the era in which Artificial Intelligence has become an inevitable part of the educational process. Keeping in view all these the Universities have to prepare their students for the future so that they can become employable or adopt entrepreneurship as a career choice. This perspective shall change the curriculum and the entire teaching-learning process to transform it into a training program and enhance the learning experience of the students.

## 2. Need and Importance of Evaluation

To cope with the changes, training is one of the most important activities in every organization. Training evaluation means assessing the impact of training on the performance of the trainees and their behavior. Hamblin (1974) defined the process of evaluating training and development as: “any attempt to obtain information (feedback) on the effects of the training program, and to assess the value of the training in the light of that information”. Similarly keeping the requirements of Education 4.0 in mind educational institutions should adopt the following principles for the evaluation of their students.

**Table 1 : The Level of Evaluation Depends Upon the Following Principles:**

	Reaction (level 1)	Learning/ understand ing (level 2)	Applicati on (level 3)	Impact (level 4)	Return on investment (level 5)
Mome nt of evaluat ion	During or directly after the learning program	During or directly after the learning program	2 – 6 months after the learning program	6 – 12 months after the learning program	12-24 months after the learning program

- **Reaction:** It is the immediate reaction that the learners give to the learning that they receive.
- **Learning:** It is the stage of gaining knowledge, developing skills and attitudes, and changing capabilities.
- **Application:** It is a stage wherein the learner experiences the practical implementation of their learning in real life.
- **Impact:** In this stage observe the results of the implementation of learning.
- **Return:** In this stage, the results could be the ability to perform in a superior way, and improve process quality and high productivity (results).

- As evaluation and assessment affect the learning process, they can also be used as learning tools. The universal truth is people tend to pattern their work behavior as they are assessed. So, assessment primarily influences the teaching/ learning process pattern. The other aims of evaluation contain the following things:
- To determine whether the objectives of learning are achieved.
- To evaluate the effectiveness of various components of the learning such as contents of the program, the tools, facilitation skills, relevance of material distributed, method of assessment and evaluation, etc.
- To assess the worth of the program, and its value for money.
- To find out whether the program was successful enough to provide meaningful insights and impart practical skills.

Organizations have adopted various models for evaluation according to their requirements, traditions/convenience. Two Broad approaches to program evaluation are goal-based and system-based.

The system-based approach deals with the level to which the program objectives or process objectives have been attained. On the other hand, the goal-based evaluation approach deals with the extent to which the actual outcome was attained and measured.

Researchers have proposed numerous models for evaluation. Some Contemporary, relevant, and significant amongst them have been evaluated critically in this study. They are as follows:

- I. Kirkpatrick's Four-Level Training Evaluation Model
- II. CIPP Evaluation Model (1983)
- III. Congruence-Contingency Model
- IV. CIRO (Context, Input, Reaction, Outcome) Model
- V. Responsive Evaluation Model
- VI. Kaufman's Five Levels of Evaluation

## VII. Phillips's Five-Level Training Evaluation Model

## VIII. ROI (Return on Investment) Model

As per the definition of training given by Dale S. Beach, training is an organized procedure with the help of which people impart necessary knowledge and develop certain skills for some definite purpose. Similarly, higher education should also be considered a training program for acquiring knowledge and developing certain skills.

The Kirkpatrick Model is a globally known instrument for evaluating and analyzing the outcomes of educational, training, and learning programs. The model clearly distinguishes between reaction outcomes, learning outcomes, behavioral outcomes, and organizational outcomes. Although the model is being used globally and has proven its worth from time to time still there is need for a sophisticated and scientific assessment of learning outcomes of higher education. The major focus of this study was to apply such a mechanism which is an integrated system for evaluating the effectiveness of higher education programs at individual and organizational levels. Hence the following research question was developed:

Research Question: How to evaluate the effectiveness of the higher education program?

### A. Methodology adopted:

This is an exploratory study, descriptive as well as empirical in nature. It focuses mainly on AICTE-affiliated MBA institutes associated with RTM Nagpur University, Nagpur. The research methodology of this study includes a systematic literature review and a focused interview.

### B. Objectives of the Study:

1. To review the existing literature on the key models for studying the effectiveness of the program.
2. Critically evaluate the evaluation models.
3. Proposing a new model for evaluation of higher education programs.

### C. Review of Literature

- 1) The first model covered in this study is the “Four-Level Model” proposed by, Donald Kirkpatrick, former Professor Emeritus at the University of Wisconsin in the year 1959.

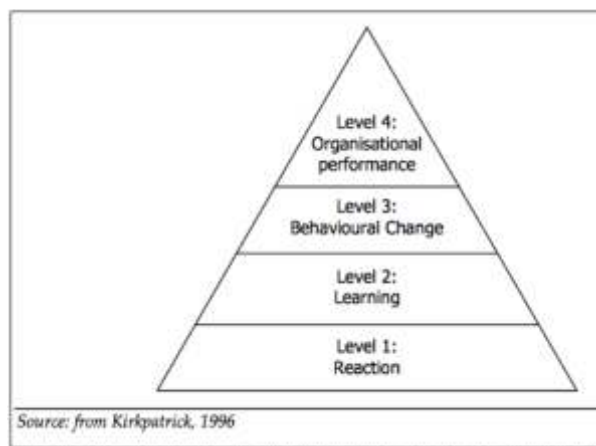
It is a recognized tool to measure and evaluate the outcome of any educational or training program. It evaluates both formal and informal teaching-learning methods and rates them against four levels: reaction, learning, behavior, and results –.

Level 1 Reaction: The first level is all about knowing what the students (learners) want to know from the program.

Level 2 Learning: The second level is about knowing to what extent the changes in knowledge, skills, and attitude were achieved by the students (learners).

Level 3: Behavior: The third level is knowing the extent to which the behavior changes and improvement in performance after applying the learnings of the program.

Level 4: Results: In this stage the level to which the changes in the organization have been impacted because of the implementation of learning into practice i.e. the effect of the learner's performance in the organization. It is one of the most common and effective ways of identifying the effectiveness of any program and it is the most popular model used worldwide



**Fig.1: Kirkpatrick Model**

- 2) CIPP Model

This model was created in the year 1960 by Daniel Stufflebeam, it is considered a decision-oriented model that scientifically gathers information about a

program to recognize strengths and limitations in content or delivery, to develop program efficacy, or plan for the future of a program. This model also has four levels: the overall goals or mission (Context Evaluation); the plans and resources (Input Evaluation); the activities or components (Process Evaluation); and the outcomes or objectives (Product Evaluation).

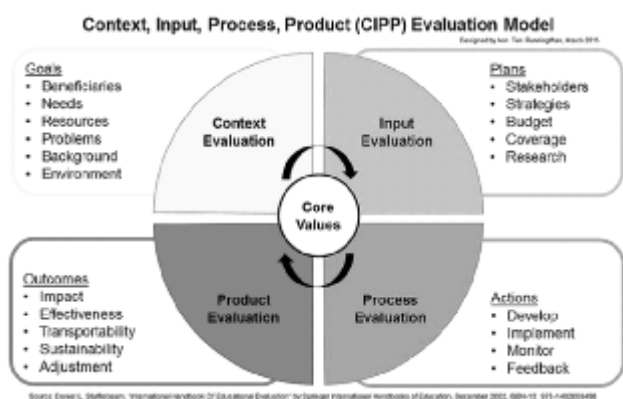


Fig. 2 : CIPP Model

The main aim of the Context Evaluation is to provide the logical reason behind the formulation of objectives. Apart from this it also identifies unfulfilled needs and recognizes the reasons behind them, which remained unfulfilled, and the curriculum environment i.e. the WHO, WHEN, WHAT, WHERE, WHY, and HOW parts are identified.

The purpose of Input Evaluation is to provide all sorts of information for determining how to use various resources to achieve the objectives. The other purposes of this model are analysis of objectives and goals, resources and experiences to be used to achieve the goals, and comparing it with other programs and strategies.

- The process evaluation has three objectives:
- To identify lacunas in the process design or while implementation;
- Second to provide information for stereotyped decisions and third to maintain a record of the procedure as and when it occurs.
- And third, to do the Product Evaluation, the basic requirement is summative and formative data. Apart from this logical interpretation based on process information is also required.

### 3) Congruence-Contingency Model

The Congruence-Contingency Model was developed by Robbert Stake in the year 1969. The three categories of data provided by this model are as follows:

- **Antecedents:** These are the circumstances that exist before teaching and learning take place. The nature of the instructors, how the curriculum is implemented, the materials and resources that are available, and the setting are some examples of such circumstances.
- **Transactions:** These are the events that take place while teaching-learning is being done. Here, emphasis will be placed on the evaluation process, contact hours, and facilitation methodologies.
- **Outcomes:** The intended effects of a certain curriculum are referred to as outcomes. Here, emphasis will be placed on teachers' knowledge, their ability to teach, and their beliefs and attitudes in light of societal demands and inspirations.

The Congruence-Contingency Model offers the researcher the opportunity to contrast desired outcomes with actual outcomes. From this model, the researcher may decide what standards to apply to assess if the curriculum's results are accomplishing the goals they were intended to.

### 4) CIRO Model

This model was developed by Peter Warr, Michael Bird, and Neil Rackham in the year 1970 to evaluate management Training. According to NEP, every post-graduate program has to be treated as training so the CIRO Model can be applied for the evaluation of learners. The CIRO Model, like other models for evaluating training, is hierarchical, requiring practitioners to begin at the first of its four levels before moving on to the subsequent levels consecutively. The CIRO Model and other training assessment methods, including the Kirkpatrick Model and the Phillips ROI Model, that have been explored in the past are comparable in this regard. According to this concept, evaluation is significant in terms of context, input, reaction, and outcome. The immediate, intermediate, and ultimate objectives are determined in the context evaluation, which is a collection of data on performance deficiencies.



When doing the input evaluation, the following inquiries are pertinent: What are the relative advantages of the various facilitation techniques? Is it possible for an independent entity to run the program more effectively? Should internal resources be used to build it? How much time may be dedicated to specific inputs? What outcomes were obtained in the past when a comparable program was run? The Reaction Evaluation provides participant-subjective evaluations of the whole program. Finally, the outcome evaluation establishes the goals of training, chooses and creates certain metrics for achieving those goals, takes the measurements at the right moment, and then evaluates the outcomes to enhance future programs.

### 5) Responsive Evaluation Model

Similar to the Eisner Connoisseurship Model, the "Responsive Evaluation Model" (Stake, 1975) places more emphasis on characterizing actions and processes than test results and outcomes. It aims to "convey the program's narrative." A method of formal program assessment for education and social services is responsive evaluation. Assess the ability and value of a program or activity, it starts with the problems and worries of different stakeholders. It emphasizes individual experience and draws on how individuals typically judge quality. It is a ten-step formal assessment strategy that includes developing an evaluation framework with sponsors, getting sponsors' input on subjects, issues, and/or questions of concern, the creation of evaluation-guiding questions; the definition of the curriculum's focus and activities in light of client and staff requirements; the preparation of observation logs and case studies; the distillation of data and the identification of the key issues or questions; presenting preliminary findings in a tentative report, analyzing responses, looking into the main issues in further detail, searching for contradictory evidence that would undermine findings and corroborating evidence that would support findings, and finally reporting the findings.

### 6) Kaufman's Five Levels of Evaluation

In the Kaufman Model, the scope of evaluating the impact of training goes beyond the institute, it includes how training benefits society and the surrounding environment in the institutes.

The Kirkpatrick method is essentially the foundation of this paradigm. The 5 levels of this

model consist of the following levels:

- (i) Input and Process: Enabling and Reaction are the two sub-parts that make up this model. The purpose of enabling us to assess the quality and availability of financial and physical resources. This level serves as an input to Reaction, which assesses the effectiveness and acceptance of the training's methodologies and procedures.
- (ii) Acquisition: At this level, a test group or individual's proficiency and mastery are assessed in a controlled environment.
- (iii) Application: This level's goal is to assess a group's or an individual's performance depending on how they are using the training program material.
- (iv) Organization Output: The goal of this level is to assess the contributions and benefits of the entire organization as they are related to the training. One indicator used to assess overall success is ROI.
- (v) Societal Outcomes: This level examines how the training affects the contributions to and from the end-user are impacted by the training. Investigated success indicators include payoffs, repercussions, and responses.

### 7) Phillips's Five-Level Training Evaluation Model

Dr. Jack Phillips asserts that the implementation of a training program should result in a chain of effects at several levels, starting with satisfaction and planned action and concluding with ROI. The remaining levels must also be assessed to gauge business outcomes and ROI (Levels 4 and 5).

To influence business, skills, and knowledge acquired at Level 2 and Level 3 should be utilized in a chain through the levels (Level 4). It is impossible to establish that the program genuinely contributed to the attained business results if measurements are not made at each level. The assessor should be able to pinpoint the broken link(s) in the chain, such as the participant's failure to learn (Level 2) or their inability to properly use the new knowledge on the job, if a poor ROI is the consequence of the training expenditure (Level 3). Moving from Level 1 (Reaction, Satisfaction, and Planned Action) to Level 5 along the chain of influence, from the viewpoint of the organization, improves the value of the information

acquired.

### 8) ROI (Return on Investment) Model

The assessment model that resulted from Drs. Donald Kirkpatrick and Jack Phillips' research has grown to be the most reputable and often employed training and HRD evaluation approach in the world. Even the Phillips model provides a useful technique to estimate the possible ROI (return on investment) of a planned training or human resources development effort before allocating funds.

A financial statistic that may be used to assess training and development investments is a return on investment (ROI) based on the Phillips method. Using this simple decision support tool, businesses can easily create and evaluate the business case for spending money on workforce development. The ability to quantify the return on investment enables a company to weigh the financial gains of a program against those expenditures. ROI (Return on investment), is the degree to which the outputs of training surpass the inputs. It enables an organization to compare the financial advantages of the program with its expenses. Following are the five levels of this model:

A. Reaction & Planned Action: Evaluates participant response to the program and lays forth detailed implementation strategies.

B. Learning: measures changes in abilities, knowledge, or attitudes

C. Job Applications: Analyze how your conduct has changed at work and how the training has been put to use.

D. Business Results: evaluates the program's effects on the business

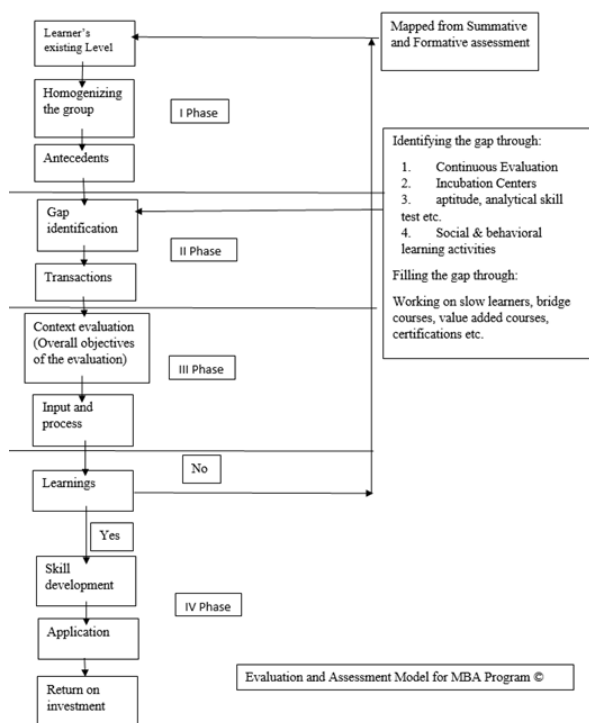
E. Return on Investment: It calculates a percentage-based measure of the results' monetary worth and program cost.

### 3. Critical Analysis of All The Models:

It may be concluded that each strategy for evaluating training efficacy has distinct outcomes and opinions based on results. Taking into consideration the various levels of evaluation it was predominantly observed that although the Training and development fraternity has been using such evaluation models for their training programs, the educational institutions offering professional programs did not take into consideration any of the above-mentioned evaluation models concerning these programs. None of the models takes into consideration the current level of students, how to measure the current level and the improved level, how to identify the gap between his past learnings and the learnings that the institute wants to imbibe into him, and how to fill this gap, skill

### ANNEXURE-I

Model Level	Kirkpatrick	CIPP	Congruence-Contingency	CIRO	Responsive Evaluation	Kaufman's Five Levels of Evaluation	Phillips 5-level training	ROI Model
	Reaction	Context Evaluation	Antecedents	Context	Key issues	Input & process	Reaction, Satisfaction, planned action	Reaction & Planned Action
	Learning	Input Evaluation	Transactions	Input	Preliminary findings	Acquisition	Participant's failure	Learning & Failure
	Behavior	Process Evaluation	Outcomes	Reaction	Analyzing response	Application	ROI of training expenditure	Job application
	Results	Product		Outcome	Looking into the main issue	Organization	ROI Utilization	Business results
					searching for contradictory evidence	Output	Influence on organization	Return on investment
						Societal outcomes		



**Fig. 3 : Evaluation and Assessment Model for MBA Program**

development in the students, ensuring application of his learning in practical life, gaps remaining after going through the learning process/program partially, etc. Taking these aspects into consideration which are missing in the process of evaluating the researchers have developed the following model which addresses all the above-mentioned issues:

According to this model in the first phase, it should be mandatory for the organizations to identify the level of learners through their summative and formative assessment after getting admission in their respective programs. The key issues or areas for improvement have to be identified. The group should then be homogenized to a particular predetermined level. This may be achieved through preparatory classes, not simple induction or introduction to the MBA Programme and faculty members. After the preparatory classes, the post-preparatory level of learning needs to be mapped. Given this, mapping this gap between levels ought to be achieved, and needs to be determined. Accordingly, inputs may be designed and delivered.

In the second phase, the gap can be identified through a continuous process, various activities undertaken, the incubation centers of the institutions, industry exposure through an internship (not a simple

one-day visit), presentations, and seminars. One may also administer specific aptitude and analytical skill tests in addition to the above. The gap thus unveiled can be filled up with the help of working on slow learners, bridge courses, value-added courses, certification, etc.

Once this is done then in the third phase the context evaluation has to be done i.e. the overall evaluation objectives have to be designed. Then accordingly the evaluation parameters, criteria, and appropriate evaluation tools & methods need to be identified and developed. Utmost care needs to be taken while designing and moderating tests to ensure proper distribution of the level of difficulty. That means all/most of the questions should neither be Easy/Very easy nor all/most of them should be difficult/ very difficult. The distribution should be judicious for achieving nonambiguous results according to Bloom's Taxonomy.

After getting the results, the institute has to have a comparative analysis of the learnings drawn by the learners and the standards set by the institute for the given time frame (semester) case if the results are not found up to the mark, then again, the second step has to be repeated otherwise the learner can move towards fourth and the last phase of the application of his learnings into practical life and become ready for placements.

In the fourth stage, the institute will get an idea about the capability of the candidate and can make necessary efforts towards placement. Thus, the return on investment, not only in terms of money but in terms of time, effort, facilities, and opportunities given to the learners can be measured.

#### 4. Summative Assessments:

Elements of Summative assessments: Five key evaluative components that make up the best practices for creating effective summative assessments :

- **Authenticity:** The evaluation shows a variety of authentic real-world abilities acquired outside of the classroom.
- **Reliability:** The test yields a result that is consistent across classroom settings, student groups, and routine circumstances.
- **Volume:** Students who are fatigued from tests

won't give accurate answers on any test. So spread out the assessments throughout the semester.

- **Validity:** What was taught to the students throughout the sessions should be accurately reflected in the assessment.
- **Variety:** Students should be encouraged to use multiple modes of skill and knowledge demonstration during the evaluation.

It may include the following tasks:

Group projects in graduation, presentations, Focus Behaviour Review Interview (FBRI), Five Factor Personality Test, Pfeffer's Test of self-efficacy, Mayer Brigg's Type Indicator (MBTI), Test of Aspiration, Social Contribution till graduation apart from Grades obtained Locus of control inventory, etc.

Formative assessment:

There are four elements of formative assessment: 1) identifying the "gap," 2) feedback, 3) student involvement, and 4) learning progressions. Teachers need to have a clear understanding of each of these elements

- **Identifying the "Gap":** According to Goldilocks finding the "just right gap" is a crucial step in the formative evaluation process. It is the responsibility of the teacher to identify immature but developing structures, to build on them, and to promote cognitive development through cooperation and direction through measures like projects. The process results in the student understanding the tools needed to solve a specific challenge, and these tools then form a component of the student's developmental success.
- **Feedback:** To let students determine their future actions, feedback is crucial. Sadler's model strongly emphasizes feedback to students through the use of the feedback loop. Teachers and their pupils are both involved in this loop's continuing process. Effective teacher feedback tells students where they are in a learning progression, how their understanding differs from the desired learning goal, and how they might advance. It is straightforward, detailed, and criterion-based. By altering instruction, reassessing to provide additional information on learning, readjusting

instruction, and so forth, the teacher works to close the gap between the student's current learning and the goal. Learners must be able to use feedback from formative assessments to enhance their learning

- **Student's involvement:** To engage with their teachers in creating a shared understanding of their current learning status and what they need to do to advance in their learning, as Sadler suggests, students learn the skills of self-assessment and peer assessment during formative assessment
- **Learning progressions:** Learning progressions give teachers a clear image of what needs to be taught and assist them in identifying where on the learning continuum each student is currently in their development.

It may include the following tasks:

- **Drawing concept maps,** asking the students to summarize the lecture/session learnings, small projects/research papers under the guidance of the teachers, etc.
- **Continuous evaluation:** It includes both Co-scholastic and Scholastic areas. Co-scholastic areas encompass life skills, abilities in co-curricular domains, attitudes, and values, whereas curricular or subject-specific activities are covered by scholastic areas.
- **Co-scholastic activities:** These may comprise Life Skills, Attitudes, Human Values, Cocurricular activities, and Aesthetic, visual, and performing arts.

Assessment for life skills includes:

1. **Individual assessment:** It focuses on the assessment of an activity/task performed by any student.
2. **Group assessment:** It focuses on the learning and progress of a group of students working on a task together to complete it.
3. **Self-assessment:** It refers to the student's assessment of her/his learning and progress in knowledge, skills, processes, interests, attitudes, etc.



4. Peer assessment: It refers to one student assessing other students. This can be conducted in pairs or groups.

Assessment for attitude includes:

The Self-Rating questionnaire, Psycho-metric questionnaire, Psycho-analytical tests, etc.

Assessment for Human values includes:

Lectures by experts, Associations by NGOs, Social Activities like Blood donation camps, Distribution of food in slums, Educational/health check-up camps for needy people, College fete to assess business acumen (in groups comprising of different specializations) followed by presentations, etc.

Co-curricular activities can generally be classified into five categories

1) Literary Activities 2) Physical Development Activities 3) Civic Development Activities 4) Social Welfare Activities 5) Excursion Activities 6) Film Appreciation

Aesthetic activities, Performing and Visual arts Co-curricular activities also include several activities like Music, Vocal, Instrumental, Dance, Drama, Craft, Sculpture, Puppetry, Folk Art forms, Business plan competitions, designing ad campaigns can be organized to develop aesthetic sense among students.

Scholastic activities: Live projects, Music, Lab activities, various simulation exercises, structured

**Table 3: Type of Assessment and Typology**

S. No.	Type of Assessment	Some Suggestive Instrument	Typology of instrument
1.	<b>Summative assessments</b>	Learnings from Group projects in graduation	Experiential learning
		Presentations	Structured evaluation
		Focus Behaviour Review Interview (FBRI)	Behavioural Interview
		Five-Factor Personality Test	Psychometric test
		Mayer Brigg's Type Indicator (MBTI)	Psychometric test
		Test of Aspiration	Psychometric test
		Locus of Control Inventory	Psychometric test
		Thematic Apperception Test (TAT)	Psychoanalytical test
		Pfeffer's Test of Self-efficacy	Psychoanalytical test
		Social Contribution till graduation if any	Sense of Social Responsibility

2.	<b>Formative assessment</b>	Drawing concept map	Knowledge Assimilation
		Summarising the lecture by students/session learnings	Knowledge Assimilation
		Small projects/research papers under the guidance of the teachers	Knowledge Assimilation
		Quiz, Crossword puzzles	Knowledge Assimilation
		College fete to assess business acumen (in groups comprising of different specializations) followed by presentation	Experiential learning, Demonstration of skills acquired
		Live projects, Lab activities, various simulation exercises, structured and semi-structured instruments for assessing managerial capabilities, use of case lets and case studies, etc.	Experiential learning, Demonstration of skills acquired
3.	<b>Co-scholastic activities:</b>	Outbound training programmes, NSS, NCC camps	Life Skills, Attitudes, Human Values
		Cultural events, Skit, Music, Drama, Film appreciation, etc	Cocurricular activities and Aesthetic, visual, and performing arts.
4.	<b>Assessment for life skills activities</b>	Mock Drills, Team Work / Assignment, Role Play	
5.	<b>Assessment for attitude</b>	A self-rating questionnaire, Psycho-metric questionnaire, Psycho-analytical tests, etc.	
6.	<b>Assessment for Human Value Activities</b>	Lectures by experts, Associations with NGOs, Social Activities like Blood donation camps, Distribution of food in slums, Educational/health check-up camps for needy people, etc.	
7.	<b>Co-curricular activities</b>	Literary Activities, Physical Development Activities, Civic Development Activities, Social Welfare Activities, Excursion Activities	

and semi-structured instruments for assessing managerial capabilities, use of case lets and case studies, etc.

While conducting the assessment wherever a psychometric test is used it should be combined with either an additional psychometric/psychoanalytical / FBRI or a simple interview to reduce the element of subjectivity.

## Conclusion:

Getting a good return on investment requires connecting the training function and activities to the institute's total activities which include all sorts of input provided to the candidates and the evaluation tools and techniques. The Kirkpatrick four-level assessment methodologies are still the most widely utilized evaluation framework as per the literature available.

The number of learners with individual goals for learning and progress, as well as the average number of training hours required for the learners, are all factors that the institutes imparting training emphasize. A training program is not finished until the techniques and outcomes have been assessed, so evaluation is one of the most important factors in every program may it be training provided to the employees or training provided to the students. Hence evaluation tools and techniques have to be developed very meticulously keeping all the aspects of development into consideration.

## Suggestions:

The teachers/ professors are required to get into the role of a facilitator of learning rather than a hardcore teacher, making efforts, and trying to drive principles, concepts, and theories into the minds of the learners. They need to develop an in-depth understanding of adult learning principles, processes, and associated andragogy as the learners coming for these programs are adults. This calls for a paradigm shift. To achieve this the teachers, need to accept, internalize, and develop a strong conviction about their role as a facilitator of learning.

These facilitators need to master the art of creating, identifying, and administering case studies and case-lets. They also need to develop skillsets to choose and use and also may be, to design and develop psychometric or psycho-analytical tools.

They should also enhance their competencies to conduct and administer psychometric or psycho-analytical tools, FBRI, and FGD/GD effectively.

Evaluating the outcomes of psychometric and specifically psycho-analytical tests is not a layman's task. It requires certain skills and expertise which need to be developed among the facilitators. This will help them achieve an in-depth understanding of

instruments and the rationale behind it will also be clearly understood.

For all this to take place it is of utmost importance to impart systematic and scientific training interventions. So, the institutes will have to invest in developing the facilitators. None of the facilitators should be excused for whatever reason from a professional development program of this nature.

There should also be a mechanism to take feedback from a student who has already been placed by their respective employers to understand and identify if any common gaps are being observed during their performance and incorporate measures to include or give more weightage to those particular components in the process of learning.

All this may get due attention if these are incorporated into policy documents or in the form of directives from organizations like AICTE. Another way can be to ensure that these factors are taken into consideration in the process of accreditation and some mechanism has to be designed to ensure it is not mere compliance and is followed in letter and spirit.

## REFERENCES

- [1] Royce Sadler, D. (2012). Assessment, evaluation and quality assurance: Implications for integrity in reporting academic achievement in higher education. *Education Inquiry*, 3(2), 201–216. <https://doi.org/10.3402/edui.v3i2.22028>
- [2] Winstone, N., Bourne, J., Medland, E., Niculescu, I., & Rees, R. (2021). “Check the grade, log out”: students’ engagement with feedback in learning management systems. *Assessment and Evaluation in Higher Education*, 46(4), 631–643. <https://doi.org/10.1080/02602938.2020.1787331>
- [3] Gallardo, K. (2020). Competency-Based Assessment and the Use of Performance-Based Evaluation Rubrics in Higher Education: Challenges Towards the Next Decade. *Problems of Education in the 21st Century*, 78(1), 61–79. <https://doi.org/10.33225/pec/20.78.61>
- [4] Pereira, D., Flores, M. A., & Niklasson, L. (2016). Assessment revisited: a review of research in Assessment and Evaluation in Higher Education. *Assessment and Evaluation in Higher Education*.

- Education, 41(7), 1008–1032. <https://doi.org/10.1080/02602938.2015.1055233>
- [5] allintitle: “assessment and evaluation in higher education” - Google Scholar. (n.d.). Retrieved July 13, 2022, from [https://scholar.google.com/scholar?start=20&q=allintitle:%22assessment+and+evaluation+in+higher+education%22&hl=en&as\\_sdt=0,5&as\\_ylo=2010&as\\_yhi=2022](https://scholar.google.com/scholar?start=20&q=allintitle:%22assessment+and+evaluation+in+higher+education%22&hl=en&as_sdt=0,5&as_ylo=2010&as_yhi=2022)
- [6] Brunstein, J., Jaime, P., Curi, D. P., d'Angelo, M. J., & Mainardes, E. W. (2015). Assessment and evaluation of higher education in business management: an analysis of the Brazilian case in the light of social learning theory for sustainability. *Assessment and Evaluation in Higher Education*, 40(6), 833–854. <https://doi.org/10.1080/02602938.2015.1041096>
- [7] Dinning, T. (2018). Assessment of Entrepreneurship in Higher Education: An evaluation of current practices and proposals for increasing authenticity. *Compass: Journal of Learning and Teaching*, 11(2). <https://doi.org/10.21100/compass.v11i2.774>
- [8] Brown, D., & Johnson, N. (2020). The importance of assessment and evaluation in higher education information technology projects. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 12427 LNCS, 222–233. [https://doi.org/10.1007/978-3-030-60152-2\\_18](https://doi.org/10.1007/978-3-030-60152-2_18)
- a. allintitle: “assessment and evaluation in higher education” - Google Scholar. (n.d.). Retrieved July 13, 2022, from [https://scholar.google.com/scholar?start=20&q=allintitle:%22assessment+and+evaluation+in+higher+education%22&hl=en&as\\_sdt=0,5&as\\_ylo=2010&as\\_yhi=2022](https://scholar.google.com/scholar?start=20&q=allintitle:%22assessment+and+evaluation+in+higher+education%22&hl=en&as_sdt=0,5&as_ylo=2010&as_yhi=2022)
- [9] HADDAD-ADAIMI, M., ZEID DAOU, R. A., & DUCQ, Y. (2022). Internship Assessment and Evaluation in Higher Education. *International Journal on Integrating Technology in Education*, 11(1), 17–33. <https://doi.org/10.5121/ijite.2022.11102>
- [10] Brunstein, J., Jaime, P., Curi, D. P., d'Angelo, M. J., & Mainardes, E. W. (2015). Assessment and evaluation of higher education in business management: an analysis of the Brazilian case in the light of social learning theory for sustainability. *Assessment and Evaluation in Higher Education*, 40(6), 833–854. <https://doi.org/10.1080/02602938.2015.1041096>
- [11] Bušelić, V., & PažurAničić, K. (2019). Developing ICT students' generic skills in higher education: towards a model for competence assessment and evaluation. *Proceedings of the Central European Conference on Information and Intelligent Systems*, 2007, 67–75. <https://search.proquest.com/openview/c1b73d7326a4d3002459a5d2028bf18a/1?pq-origsite=gscholar&cbl=1986354>
- [12] Lambrechts, W., & Rymenams, S. (2015). Sustainability assessment in higher education : first application and evaluation of AISHE 2.0 in Belgium. *Global Cleaner Production and Sustainable Consumption Conference*, November, 1 – 4 . <https://lirias.kuleuven.be/1689772?limo=0>
- [13] Brown, D., & Johnson, N. (2020). The importance of assessment and evaluation in higher education information technology projects. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 12427 LNCS, 222–233. [https://doi.org/10.1007/978-3-030-60152-2\\_18](https://doi.org/10.1007/978-3-030-60152-2_18)
- [14] Mentkowski, M., & Astin, A. W. (1992). Assessment for Excellence: The Philosophy and Practice of Assessment and Evaluation in Higher Education. In *The Journal of Higher Education* ( Vol. 63 , Issue 6 ) . <https://doi.org/10.2307/1982058>
- [15] Secolsky, C., & Denison, D. (2017). Handbook on Measurement, Assessment, and Evaluation in Higher Education. In *Handbook on Measurement, Assessment, and Evaluation in Higher Education* . <https://doi.org/10.4324/9781315709307>
- [16] Handbook on Measurement, Assessment, and Evaluation in Higher Education. (2017). *Handbook on Measurement, Assessment, and Evaluation in Higher Education*.

- <https://doi.org/10.4324/9781315709307>
- [17] •Beutel, D. (n.d.). Adie, L., Lloyd, M., & Beutel, D. (2013). Identifying discourses of moderation in higher education. *Assessment and Evaluation in Higher Education*. Core.Ac.Uk. Retrieved July 13, 2022, from <https://core.ac.uk/download/pdf/151744242.pdf>
- a. Pereira, D., Flores, M. A., & Niklasson, L. (2016). Assessment revisited: a review of research in Assessment and Evaluation in Higher Education. *Assessment and Evaluation in Higher Education*, 41(7), 1008–1032. <https://doi.org/10.1080/02602938.2015.1055233>
- [18] Dinning, T. (2018). Assessment of Entrepreneurship in Higher Education: An evaluation of current practices and proposals for increasing authenticity. *Compass: Journal of Learning and Teaching*, 11(2). <https://doi.org/10.21100/compass.v11i2.774>
- [19] Van Haneghan, J. P. (2011). The Impact of Technology on Assessment and Evaluation in Higher Education. *Igi-Global.Com*, 222–235. <https://doi.org/10.4018/978-1-60960-147-8.ch016>
- [20] Mentkowski, M., & Astin, A. W. (1992). Assessment for Excellence: The Philosophy and Practice of Assessment and Evaluation in Higher Education. *The Journal of Higher Education*, 63(6), 717. <https://doi.org/10.2307/1982058>
- [21] MHRD, G. of I. (2020). National Education Policy 2020 Ministry of Human Resource Development Government of India. 1–66. [https://www.education.gov.in/sites/upload\\_files/mhrd/files/NEP\\_Final\\_English\\_0.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf)
- [22] NEP1. (n.d.).
- [23] Haworth, J., & Vincent, P. (1974). *Advanced Geography and Geographical Learning*, 6(2), 113–116.
- [24] Shubhada, & Niranth. (2021). New Education Policy 2020: a Comparative Analysis With Existing National Policy of Education 1986. *International Journal of Research and Analytical Reviews*, 8(2), 665–675. [www.ijrar.org](http://www.ijrar.org)
- [25] Budiarti, noviyulia. (2020). Title. Sustainability (Switzerland), 4(1), 1–9. <https://pesquisa.bvsalud.org/portal/resource/en/mid1-20203177951%0Ahttp://dx.doi.org/10.1038/s41562-020-0200-0884-z%0Ahttps://doi.org/10.1080/13669877.2020.1758193%0Ahttp://serisc.org/journals/index.php/IJAST/article>
- [26] Venkateshwarlu, B. (2021). A Critical Study of NEP 2020: Issues, Approaches, Challenges, Opportunities and Criticism. *International Journal of Multidisciplinary Educational Research*, 10(2), 191–196. [www.ijmer.in](http://www.ijmer.in)
- [27] Budiarti, noviyulia. (2020). Features of Nep 2020: Higher Education. Sustainability (Switzerland), 4(1), 1–9. <https://pesquisa.bvsalud.org/portal/resource/en/mid1-20203177951%0Ahttp://dx.doi.org/10.1038/s41562-020-0200-0884-z%0Ahttps://doi.org/10.1080/13669877.2020.1758193%0Ahttp://serisc.org/journals/index.php/IJAST/article>
- [28] Garrett, N. D., Marques, J., & Dhiman, S. (2012). Assessment of Business Programs: A Review of Two Models. *Business Education & Accreditation*, 4(2), 17–25.
- [29] Developing an MBA Assessment Program. (n.d.).
- a. Evaluation Concept in Management. (n.d.).
- b. Are, F., Which, T. H. E. P., & Be, M. (n.d.). Following Are the Pre-Requisites Which Must Be Accreditation of the Management Programme [Mba] in a.
- [30] Dubas, K. M. (2017). Effective design and assessment of an MBA degree program through benchmarking. *Innovative Marketing*, 13(4), 25–34. [https://doi.org/10.21511/im.13\(4\).2017.03](https://doi.org/10.21511/im.13(4).2017.03)
- [31] Gupta Choudhury, R., & Sharma, S. (2015).



- Recent Trends and Performance Metrics Evaluation of MBA Students in Reputed Business Schools in India. *IOSR Journal of Research & Method in Education* Ver. III, 5(5), 2320–7388. <https://doi.org/10.9790/7388-05535661>
- [32] Cengiz, H., & Yuki, M. (1998). Measuring Value in MBA Programmes. *Education Economics*, 6 ( 1 ) , 1 1 – 2 5 . <https://doi.org/10.1080/096452998000000002>
- a.Outcome\_Evaluation\_Meaning. (n.d.).
- [33] Carter McNamara. (2005). Basic Guide to Program Evaluation. 1–15.
- [34] Ghosh, S. (2020). Training Evaluation Models: an Analysis. *Psychology and Education Journal*, 5 7 , 6 6 8 9 – 6 6 9 5 . <http://psychologyandeducation.net/pae/index.php/pae/article/view/3643>
- [35] Wankhade, R. S. (2021). Higher education and nep-2020. *International Journal of Researches in Social Science and Information Studies*, I(Viii), 51–56. [www.ijrssi.in](http://www.ijrssi.in)
- [36] Ananalysis of various training evaluation models. (n.d.).
- [37] Flint, J. (n.d.). Training Evaluation Theory. 3, 1–10.
- [38] Sou, G. (2008). Assessment practices of an MBA degree program. *New Horizons in Education*, 5 6 ( 3 ) , 1 – 1 9 . <https://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=45828017&site=ehost-live&scope=site>
- [39] Commission, H. L. (n.d.). Assessment Plan for the MBA Program Department of Business University of Wisconsin - Parkside I . Determinants of Assessment Requirements. 1–13.
- [40] Council, N. (2020). Nep, 2020 assessment reforms.
- [41] Dubas, K. M. (2017). Effective design and assessment of an MBA degree program through benchmarking. *Innovative Marketing*, 13(4), 25–34. [https://doi.org/10.21511/im.13\(4\).2017.03](https://doi.org/10.21511/im.13(4).2017.03)
- 25–34. [https://doi.org/10.21511/im.13\(4\).2017.03](https://doi.org/10.21511/im.13(4).2017.03) a. Qualitative Questions. (2020).
- [42] Teach, R. D. (1990). Developments In Business Simulation & Experiential Exercises , Volume 17 , 1990 Developments In Business Simulation & Experiential Exercises , Volume 17 , 1990. In *Business*, 17, 161–166.
- [43] Vinet, L., & Zhedanov, A. (2011). A “missing” family of classical orthogonal polynomials. *Journal of Physics A: Mathematical and Theoretical*, 4 4 ( 8 ) , 1 – 8 . <https://doi.org/10.1088/1751-8113/44/8/085201>
- [44] Dahiya, S., & Jha, A. (2011). Review of training evaluation. 2(1), 11–16.
- [45] Topno, H. (2012). Evaluation of Training and Development: An Analysis of Various Models. *IOSR Journal of Business and Management*, 5(2), 16–22. <https://doi.org/10.9790/487x-0521622>
- [46] Prozesky, D. (2001). Evaluation of training. *Journal of Community Eye Health*, 14(40), 6 5 – 6 6 . <https://doi.org/10.1177/0256090919780407>
- [47] Evaluation of Training Learning objectives. (n.d.).
- [48] Sankars, R., & Pavithra V. (2017). Evaluation of Training and Development. *International Journal for Research Trends and Innovation*, 2(6), 356–360. [www.ijrti.org](http://www.ijrti.org)
- [49] Sharma, S. C., & Inda, S. S. (2021). Assessment and accreditation of indian higher education institutions in light of new education policy 2020. *Purushartha*, 14(1), 125–129.
- [50] Kaurav, R. P. S., Suresh, K. G., Narula, S., & Baber, R. (2020). New Education Policy: Qualitative (Contents) Analysis and Twitter Mining (Sentiment Analysis). *Journal of Content, Community and Communication*, 1 2 ( N o v e m b e r 1 9 5 6 ) , 4 – 1 3 . <https://doi.org/10.31620/JCCC.12.20/02>
- [51] Panigrahi, S., & Gupta, S. (2021). NATIONAL EDUCATION POLICY-2020 : RETHINKING ASSESSMENT IN. August.



- [52] Aithal, P. S., & Aithal, S. (2020). Implementation Strategies of Higher Education Part of National Education Policy 2020 of India towards Achieving its Objectives. *International Journal of Management, Technology, and Social Sciences*, 5 ( 2 ) , 2 8 3 – 3 2 6 . <https://doi.org/10.47992/ijmts.2581.6012.0119>
- [53] Aziz, S., Mahmood, M., & Rehman, Z. (2018). Implementation of CIPP Model for Quality Evaluation at School Level: A Case Study. *Journal of Education and Educational Development*, 5 ( 1 ) , 1 8 9 . <https://doi.org/10.22555/joeed.v5i1.1553>
- [54] Development, H. R. (2016). Some Inputs for Draft National Education Policy Ministry of Human Resource Development Government of India. 1–43.
- [55] Saxena1, P. (2020). A New Model for Training Evaluation in The Banking Industry. *NMIMS Management Review*, 38(1), 102–122.
- [56] Choudhury, G. B., & Sharma, V. (2019). Review and comparison of various training effectiveness evaluation models for R & D Organization performance. *PM World Journal*, 8(2), 1–13. [www.pmworldlibrary.net](http://www.pmworldlibrary.net)
- [57] Draft, T., & Education, N. (2019). “LoftyIdeals , Bold Restructuring , Lurking Dangers ” The Draft National Education Policy 2019 on the Draft National Education Policy 2019. 1–16.
- [58] Other References:
- [59] MATTHEW LYNCH. (2016, Nov 22). The Edvocate. Retrieved from The Five Major Features Of Summative Assessments: <https://www.theedadvocate.org/five-major-features-summative-assessments/>
- [60] David Sadler. (2017). Concepts of Class in Contemporary Economic Geography. In D. Sadler, *Concepts of Class in Contemporary Economic Geography*. doi:<https://doi.org/10.1002/9781405166430.ch20>
- [61] Disha Gupta. (2022, Jan 25). Kirkpatrick Model: Four Levels of Training Evaluation. Retrieved from <https://whatfix.com/blog/kirkpatrick-model/>
- [62] Kirkpatrick Partners. (March 15, 1924 – May 9, 2 0 1 4 ) . Retrieved from <https://www.kirkpatrickpartners.com/about-us/don-kirkpatrick/>
- [63] Margaret Heritage. (2007, Oct 1). KAPPAN. Retrieved from Formative assessment: What do teachers need to know and do?: <https://kappanonline.org/formative-assessment-heritage/>
- [64] Pillay (Education Times). (2022, July 25). Education 4.0 will transform the higher education landscape. Retrieved from <https://www.educationtimes.com/>.
- [65] Yale University. (2017). CIPP MOdel. Retrieved from <https://poorvucenter.yale.edu/CIPP>
- [66] Educational research: Planning, conducting, and evaluating quantitative and qualitative research (4th ed). Pearson.
- [67] Crouch, C. H., & Mazur, E. (2001). Peer Instruction: Ten years of experience and results. *American Journal of Physics*, 69(9), 970–977.
- [68] Esakia, A., & McCrickard, D. S. (2016). An adaptable model for teaching mobile app development. 2016 IEEE Frontiers in Education Conference (FIE), 1–9.
- [69] Fellah, A., & Bandi, A. (2018). The Essence of Recursion: Reduction, Delegation, and Visualization. *Journal of Computing Sciences in Colleges*, 33(5), 115–123.
- [70] Guzdial, M., & du Boulay, B. (2019). The History of Computing Education Research. In S. A. Fincher & A. V. Robins (Eds.), *The Cambridge Handbook of*
- [71] *Computing Education Research* (1st ed., pp. 11–39). Cambridge University Press.
- [72] Hamouda, S., Edwards, S. H., Elmongui, H. G., Ernst, J. V., & Shaffer, C. A. (2019). RecurTutor: An Interactive Tutorial for Learning Recursion. *ACM Transactions on Computing Education*, 19(1), 1–25.