



## KNOWLEDGE BASED EVALUATION: NEED AND RELEVANCE IN PRESENT SCENARIO

\* Ms. Areeba Shahab

\*\* Dr. Ram Shanker Saxena

\* Student, Int. B. Ed. M. Ed. Spl. Ed. (ID), \*\* Associate Professor, Amity Institute of Rehabilitation Sciences, Amity University Uttar Pradesh, Noida, U.P

### Abstract

The education system has always been bound by the continuous and comprehensive processes of assessment and evaluation. The inevitability of evaluation in the system of education has led to the notion of development of new practices in evaluation. With the constant development of the education system comes the requirement of the upgradation of the processes of evaluation based on the current trends in evaluation. The present paper deals with the importance of integrating the current trends in evaluation in the education system with a specific focus on the method of knowledge-based evaluation. It speaks about the relevance and need of knowledge-based evaluation in today's world.

**Keywords:** Evaluation, Current Trends in evaluation, Knowledge-based evaluation, KBE, Knowledge.

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### Introduction:

Evaluation is an important procedure in the vast field of education. It can be considered as a systematic procedure which is followed in order to determine whether or not the objectives of a particular intervention have been reached as well the extent to which the intervention given has been effective. Thus, evaluation is a comprehensive procedure that centres around the major processes of developing a reliable and valid tool for evaluation, data gathering, data analysis based on preset norms, and therefore scoring, analysing and interpreting these gathered data. Thus, it can be said that the aim of evaluation is to determine the degree of effectiveness of the intervention strategy used in order to achieve the goal set for the intervention. Furthermore, it can be stated that evaluation can be used in various fields and throughout different time periods.

### Characteristic of Evaluation:

1. Evaluation is a & never-ending continuous process.
2. Evaluation is a comprehensive process having numerous areas to be addressed.
3. Evaluation is a cooperative process requiring collaboration between teachers, students, and even parents, guardians or other caretakers.
4. Evaluation is a remedial process, focusing upon improving the quality of learning of the students.
5. Evaluation is a guiding process for both the teachers & the students.
6. Evaluation is a systematic, step by step process.
7. Evaluation is a scientific process as it is a standard and systematic technique.
8. Evaluation is a holistic approach.
9. Evaluation is a descriptive process that includes qualitative & quantitative analysis.



10. Evaluation is learning oriented with motive of improving the learning capabilities of the student.

#### **Principles of Evaluation:**

- 1) Principle of continuity.
- 2) Principle of comprehensiveness.
- 3) Principle of completeness.
- 4) Principle of learning.
- 5) Principle of child-centrism
- 6) Principle of objectives.

#### **Types of Evaluation:**

Evaluation is of 2 main types:

**Formative Evaluation** is that type of evaluation which is conducted during the tenure of teaching. This type of evaluation focuses on the mechanism of continuous feedback and acts as a guide for the evaluator in order to find out the immediate effectiveness of the strategies used by them. Thus, formative evaluation is a process wherein a teacher tries to take in continuous feedbacks from the students by giving short assignments, worksheets, or other teacher made tests or tools of evaluation in order to quickly assess whether or not their teaching methods or strategies are effective or not. This can be done during the lesson, or after a particular lesson or the entire topic has been completed. This helps the concerned teacher to keep a check of the level to which their teaching strategies have been effective and allows them to make necessary changes during the academic year.

**Summative Evaluation** is that type of evaluation which is the final evaluation conducted at the end of the academic year. Thus, it can often be considered as term end examinations. Therefore, summative evaluation is a sum total of the effectiveness of the teaching strategies and methods used on the students which gives a final result of the significance of the teaching done by the particular teacher. Thus, it is a broader classification of evaluation wherein the overall holistic learning by the student is examined and evaluated. The

final results are drawn on the basis of this type of evaluation.

#### **Other types of evaluation:**

**Diagnostic evaluation:** also considered as the pre-evaluation, diagnostic evaluation is that type of evaluation where the teacher aims to find out the current level of the individual student in terms of his/her strengths, weaknesses, interests, skills and knowledge, and so on. This evaluation is done before implementing the intervention.

**Prognostic Evaluation:** Prognostic evaluation is a method of predictive evaluation, which means that the teacher makes a possible and effective prediction which is as accurate as possible of the individuals in terms of their current level and future potentials and therefore predicting or listing out the possible career choices for their future.

**Criteria referenced evaluation:** criterion or a fixed condition is what is used in order to refer to and finally compare the results of the performance by the students to these pre-set criteria. Thus, criteria referenced evaluation helps a teacher to evaluate the effectiveness of the teaching strategy by the individual teacher on the said students.

**Norm referenced evaluation:** norms refer to the standards that are set for a particular group of students for the purpose of evaluating the performance of the other students by comparing the scores achieved by them to this prefixed standard. Thus, the relative performance of the student in terms of the set norms is determined through this type of an evaluation.

#### **Current Trends in Evaluation: Knowledge-Based Evaluation:**

Knowledge based evaluation is a current trend in the world of evaluation where the students' understanding of the application of knowledge by the teacher is thoroughly examined. The knowledge of the students on a particular topic is determined through this process



of knowledge-based evaluation (KBE). Here, the specific knowledge of the individuals is determined and the application of the knowledge gained by the student is also determined. Thus, the tools of evaluation are such that the students have to express the application of the knowledge gained by the students. Thus, it aims to determine the critical thinking and problem-solving abilities of these individuals.

The main component of knowledge-based evaluation is knowledge. Thus, knowledge-based evaluation, in its literal sense refers to the evaluation of a student on the basis of his/her knowledge regarding the specific topic. Here, the students are evaluated on the basis of the understanding of the concept being taught, and the level to which there is clarity of the taught topic. Therefore, it is an in-depth procedure of evaluating the students on the basis of their understanding or their knowledge about the said topic.

Knowledge can be described as the information and facts gathered and the skills acquired by the students via the process of learning that can be imparted through education. However, when considering the evaluation of a student in terms of his/ her knowledge, it can be understood that the level to which the information delivered to the student has been clearly understood and can be explained and applied in practical life settings. Thus, KBE can be considered as a subjective method of evaluation of the students in terms of specific understanding of a said topic and its applicability in the practical scenario.

For example, in a computer class, the students have been taught how to use the various tools in MS Paint for making a drawing and multiple copies of it. In order to determine the knowledge gained, the teacher needs to evaluate their understanding of the topic. Here, if a teacher uses simple paper-pencil assignment method of evaluating the students' knowledge, then the student will be able to in their own words explain about the

process. However, in order to determine if they have actually understood the topic, a practical way of evaluation needs to be done. Therefore, the student can be evaluated by being asked to use a computer to make the drawing of a flower and make 5 copies of it. Here, the students will be practically examined where the teacher will evaluate his understanding of the concept and practical application of it as the students will follow a series of procedures like turning on the computer, opening MS Paint, identifying and selecting the different tools, using the tools to draw a flower, using the select tool to properly select the entire surface area of the flower, and finally giving the command of "copy" and then "paste", after which the copy of the flower is dragged and adjusted to the appropriate part of the screen.

In the above example, we can understand that knowledge-based evaluation is not limited to the basic understanding of the concept taught, but the in depth understanding and application of the knowledge gained in the practical life of the individual. Therefore, the students are evaluated on the basis of their practical understanding of the topic and not restricted to the theoretical knowledge. This therefore is a comprehensive and more subjective method of evaluation. It can also be said that knowledge-based evaluation is a sum total of the evaluation of the existing or previously acquired knowledge of the students as well as the knowledge acquired by the individual currently and further learning by the practical application of that knowledge in real life situation.

#### **Features of Knowledge Based Evaluation:**

1. **Objectivity:** this means that the process of KBE is unaffected by external factors like the personal biases of the assessor.
2. **Standardization:** this means that the questions set for the process of evaluation are based on certain



- pre-set standards and is applicable for every student.
3. **Reliability:** reliability refers to consistency in test scores. Thus, KBE must be reliable in order to be accurate and standardized.
  4. **Validity:** another was to make KBE applicable to all is to make sure the evaluation method measures what it is claiming to measure.

### Process of Knowledge Based Evaluation:

Knowledge-based evaluation follows a series of steps:

#### 1. Determining knowledge

Here, the existing knowledge of the student is determined. This can be done by following various processes like observation, interview, portfolio, discussion, and the like.

#### 2. Determining progress

This is a crucial step where the teacher continuously monitors the understanding and the progress of the students in order to determine whether or not there is any progress in the learning of the student through the teaching strategy implemented by the teacher.

#### 3. Evaluations

This is the final and the most crucial step where the students' overall learning and knowledge about the said topic is determined. This can be done in many practical procedures like demonstration, presentations, group work, and other relevant tasks.

### Strategy of Knowledge-Based Evaluation:

- a) **Tell-** tell participants what they are required to do.
- b) **Show-** demonstrate to the students how to do the task.
- c) **Do-** ask the students to carry out the tasks themselves.
- d) **Check-** monitor and check whether or not the students have done the task appropriately or not.

### Need and Relevance of Knowledge-Based Evaluation:

A study was conducted by Shamsabadi, Ramezani, Farsani, and Nematbakhsh in the year 2023 which

explored the topic of direct relation detection for the purpose of knowledge-based question answering. Here, single factorial questions and knowledge-based questions were the key variables on which relation detection was addressed. The questions for KBE were of two major types including single-relation and multi-relation question answering. The focus of this study was primarily on the single-relation questions and it is done under 2 major steps each of entity linking and relation detection. It was found out that relation detection is an effective method for generating single factor KBE. Thus, entity linking is a less effective method as compared to relation detection and consequently makes some great contributions like relation detection is independent of entity linking, relation detection follows a hierarchical pattern of organising relations, fine-tuning language models is used for words, questions and relations.

An approach of knowledge-based evaluation was examined in order to do evaluation of long answers by Goswami, Kamarkar, Bisai and Pal in 2017 with the aim of introduction of an evaluation system that helps in the conduction of programmatic evaluation in long answer in order to reduce the time spent on evaluation by an evaluator. In this study, the methods of lexical and semantic similarity measure were used. A total of five sets of question answers having a single question under each domain was administered on 2 groups of the sample, one group comprising of the examiner and the other of the examinee. Groups were compared with lexical similarity method and their answers were compared using semantic similarity measure. It was found that there was great similarity in the answers that were given between the two groups of samples, reflecting the significance of KBE.

In January of 2002, Connell had explored the topic of Knowledge based evaluation where he had studied the conceptual meaning of the terms knowledge and



understanding where the former was considered as a threshold of awareness and latter as a more comprehensive understanding. According to Connell, knowledge is broader in its meaning and is considered as a network of relationships between justification, truth and belief. He thus gave the working definition of knowledge as  $K + J T B$ , where, K stands for knowledge, J for justification systems and B for belief. He later modified this working definition into  $k = j t$ , where k is a subset of the knowledge areas for the purpose of acquiring knowledge, j refers to subset of justifications that are accepted from each item within the knowledge component and t is the truth that are mutually shared by the individuals in regard to the knowledge to be acquired. Thus, knowledge needs to be justified by the individual who has it and must be having empirical evidence or backed by truth, in order to make it a shared concept or understanding of the said knowledge, consequently leading to the expression of a shred belief. Therefore, any domain of knowledge if can adequately be justified and backed by empirical evidence can act as an element of evaluation, indicating the relevance of knowledge-based evaluation.

Clark and Thompson, in the year 1999, has conducted a research on the effectiveness of knowledge-based approach to questioning and answering. In this study, a long-term goal guiding the research was set of the creation of a huge range of questions that related to the daily life situations in which the individuals were interested. The key component of this study therefore was question-answering method by using the existing textual resources found online that allows inferring into the data and therefore giving more quality answers along with outside textual resources, therefore resulting in improvement in critical thinking and decision making. The researchers had developed an integrated question-answer manual for the individuals to both look for the required material as well as ask questions

regarding the materials. A knowledge-based question answer system thus motivates individuals to explore and find out the desired answers and thus it allows customization, controllable level of detail and robustness. The system developed for knowledge-based evaluation contained two windows displayed side by side, one with Distributed Computer Environment (DCE) or pre-written pages, while the other contained a screen with topic which was run-time generated. The first window contained the knowledge-base and the other contained relevant conceptual information adding to the knowledge base. The user is also asked to prompt or describe the specific scenario as his current knowledge base, which will ultimately lead to a customised set of data. Thus, this occurs in four consecutive steps, namely creation, elaboration, assembly, and finally presentation. The use of this system has significant benefits like the use of situation specific questions have acted as a motivator for the users and thus led them in getting engaged in the KBE procedure. The individuals were also seen to be attempting to answering unanticipated questions and the basis of their general current knowledge. Since the underlying knowledge base of this system was considered incomplete, inefficient use of it was observed in the long term, despite the creation of its prototypes by other researchers.

A research study was conducted on the topic of knowledge-based evaluation wherein its application in higher education institutions were to be determined. This study was done by Benkovic, Bohanec, Rajkovic, and Vrtacnik, in the year 1997. They had developed a multi decision making software package Decision Expert (DEX) for the assessment and expansion of the knowledge base of the individuals. A group of experts comprising of 43 individuals had gathered huge amount of data from numerous sources for this knowledge-based evaluation. The result by DEX was



incorporated along with certain performance indicators like the average scoring, the criteria for elimination and so on. 26 attributes were finally extracted and were combined into 13 categories. A comparison of the results of randomly selected institutions were done to find out that the second one had better results in terms of teacher scores and reputation, contributing to their high scores. On the other hand, the results for the students were similar for the first and second institutions. A third institution was evaluated as good while another fourth one was labelled as weak. It was thus reported that knowledge-based evaluation using DEX is helpful in determining the qualitative factor of the institution, but is not as effective for determination of a specific absolute quality.

The above review depicts the significance and importance of knowledge-based evaluation and acts as evidence of its effectiveness in the education system. It has supported the idea of implementing application-based questions for the improved quality of grasping knowledge by the students.

#### Conclusion:

Evaluation is a mandatory process that can never be skipped by any educator. It acts as a guide for the teacher as well as the students, and helps in the development of a rich quality teaching-learning process. With the changes in the various trends of evaluation, it has become important for the teachers to be well equipped with all the possible ways of implementing recent strategies of evaluation. One such current trend in evaluation is the practice of knowledge-based evaluation, which has been in talks for decades but is gaining more importance these days. KBE is the need of the hour as it is not only innovative, but also in-depth and effective way of evaluating the performance of the students. It is a great technique that allows students in becoming more engaged in understanding what they are learning and developing

the ability to apply it in their practical life. Thus, it can be concluded that knowledge-based evaluation is a method awaited to be embraced by the education system and thus universal techniques need to be developed for the standard implementation of KBE techniques of the students.

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