Degree IN TEACHER OF PRIMARY EDUCATION
Subject: Science Education
Course: 2019-20

Chapter 7. Activities for Evaluation.

1. Design

The following are examples of assessment methods that teachers can use to carry out the process of assessing the student´s progress in their learning of science:

- Teacher observations at children´s work
- Teacher-designed tasks and tests
- Work samples and portfolios.

Teacher´s observation at children´s work

Children´s participation in activities is an excellent opportunity for teachers to capture the quality of their questions, predictions, hypotheses, discussions, explanations, drawings, writings. It provides essential information about their progress in learning science. It also enables teachers to identify the difficulty of different aspects for their students to take them into account when designing further learning activities. Observations are particularly valuable in assessing the extent to which children have developed appropriate scientific skills and attitudes because the details and indicators of children´s learning emerge spontaneously. The teachers carry out the observations while the pupils are undertaking their activities, engage in discussion among them or interact with other pupils and with the teacher.

Nevertheless, a structured observation will facilitate the process. The teacher, in advance, should identify the expected outcomes of the learning situation, as well as the aspects where he/she is going to focus the attention. For example, the teacher may choose to concentrate on how children identify variables as part of planning an investigation, their willingness to reach the objectives of the work in a group. Parallel to his/her observation, the teacher will take notes about significant aspects of some children´s progress or gaps in their scientific knowledge and skills and attitudes. Teacher´s

observations complement other assessment tools to produce a comprehensive view of the child´s learning in science.

Teacher-designed tasks and tests

Teachers develop a wide range of activities to introduce children to the science contents (concepts, skills-processes and attitudes). Also, teachers use them as contexts to assess students´ progress. They involve observing, predicting, asking questions, estimating, measuring, comparing, analysing data and communicating in oral, pictorial, written and computer formats.

Curriculum profiles

Curriculum profiles provide how to assess and record the child´s progress using indicators of achievement. These indicators, sometimes grouped in sets, attempt to summarise the expected range of knowledge, skills and attitudes at various stages. To keep a record of the child´s progress, the teacher marks, highlights or shades these indicators as pupils achieve them.

Work samples and portfolios

The portfolio should contain samples of work that reflect a wide range of tasks maintained in simple folders, including also, for example, science copybooks, diaries, audiotapes and computer disks. They can contain evidence as:

- The achievement of an objective.
- Significant progress in the application of scientific skill.
- A gap (or lack of progress) exists in the child´s knowledge or skills.

The cumulative record of a child´s work allows the teacher to make an informed professional assessment about the child´s progress and his/her readiness for further learning experiences. The contents of portfolios also have a role to play in helping the teacher to review and evaluate the content, methodologies and approaches which he/she has designed and applied. They are also samples which demonstrate the effectiveness or weaknesses of strategies in children´s learning and provide relevant information for the planning of future work.

2. Evaluation criteria

Defining criteria are among the many issues of assessment practices that need to be addressed by teachers. These criteria are responses to questions of a precise nature as the following:

- When, and on what basis, can a teacher determine if a student has achieved an outcome?
- How do we know students understand the concepts in the expected level of success in the definition of an outcome?
- How students in a class need to achieve an outcome before a teacher can move onto a new result?
- What happens to students who do not achieve an outcome?
- How can teachers manage the assessment of outcomes effectively when students work at different levels?

3. Reflection on learning experience conducted

Having analysed different aspects of assessment, we can outline the following keys:

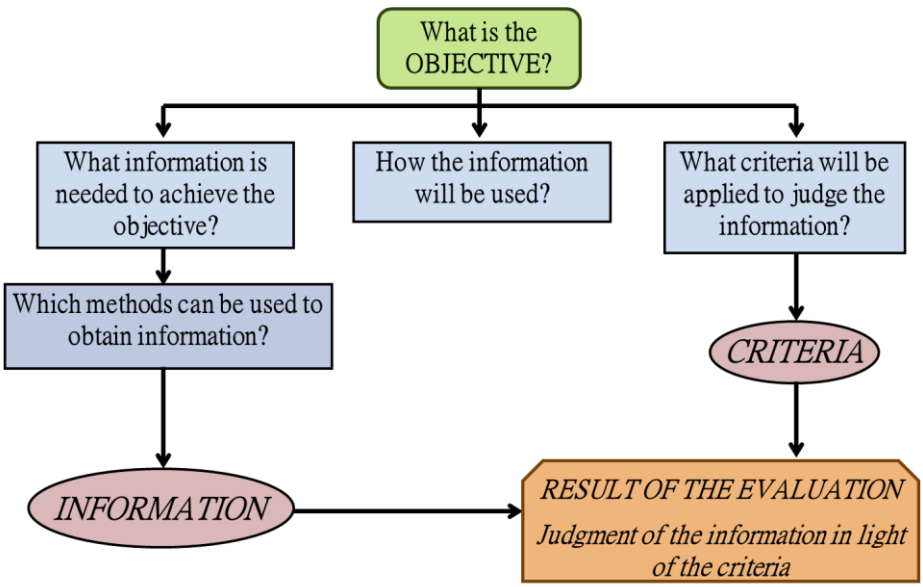
- Assessment of pupils´ progress is an essential aspect of the cycle of planning, teaching, learning, assessment and evaluation.
- We must distinguish between formative and summative assessment.
    - Formative assessment can include any activity that provides information on students´ learning for diagnostic analysis to improve teaching and learning. It also aims to gather a cumulative profile of each student´s education. Feedback from the formative assessment can assist the learner in becoming more aware of gaps between desired goals and current knowledge. The continuous formative assessment, as part of the teaching and learning processes, provides the teacher with information to assess whether or not the children have met the objectives. At the same time, the information obtained from the everyday teachers´ assessment can help with the planning of experiences that match the children´s achievement and will help their progress.
    - The summative assessment aims at collecting data for making judgments about teaching and learning at the end of a unit of work or school term.

There exists a diversity of assessment techniques to be used in collecting and recording information for the teacher´s assessment in science. They must focus on knowledge and understanding of scientific concepts, as well as scientific skills and attitudes. The collection of samples of the children´s work in portfolios provides an essential tool of assessment in science.

4. Evaluation process

The evaluation involves making value judgments about what information is relevant to make decisions and decide the criteria to obtain and judge the data collected. The distinction between information and the criteria used to judge it is essential, even if both are connected and distinguishes the evaluation of the simple opinion. However, assessment is not a process independent of the values that some have assumed, and others would like it to be.

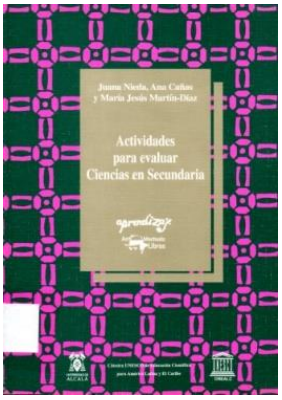
The selection of criteria, the type of information, and how both relate influence the judgment made. We can say that understanding the character and limitations of evaluation are essential concerning its usefulness. If so, the assessment will have an important role to play in the many decisions made in teaching. All these aspects correspond to **the evaluation process**; in which, it is involved to pose a series of questions and take the corresponded decisions. The scheme for this process is:



5. Evaluation instruments

Depending on the moment, we can consider three phases:

Initial evaluation (also called diagnostic): The teachers carry out it the beginning of the educational process to detect the initial ideas of the students. We can use diagnostic evaluation tests:

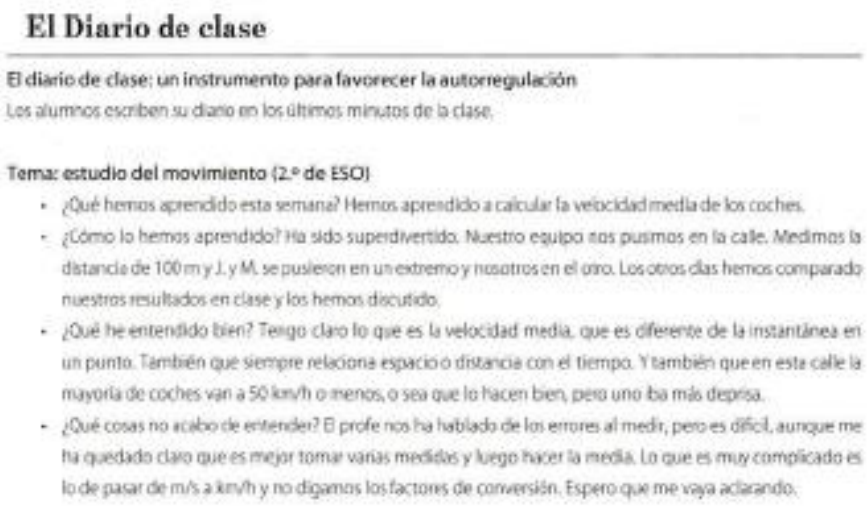


Formative evaluation (also called procedural): It develops throughout the teaching and learning process. It functions as a regulating element of the process, favouring the construction of knowledge by the students, and it becomes an essential element of learning help. It involves:

- It involves overcoming difficulties and correcting errors
- They must understand the causes
- It is necessary to find a way to overcome obstacles
- They must become aware of what they do not know and reflect
- It must allow recognising if the student can interrelate the different knowledge, in the resolution of open, real, complex and productive problems
- Do not evaluate conceptual knowledge in isolation, or only procedural and attitudinal
- It does not make sense to base the evaluation on a single exam

The teachers can plan the next two different activities:

Class diary: Activity to reflect on their difficulties and provide information to teachers



El Diario de clase

El diario de clase: un instrumento para favorecer la autorregulación

Los alumnos escriben su diario en los últimos minutos de la clase.

Tema: estudio del movimiento (2.º de ESO)

- ¿Qué hemos aprendido esta semana? Hemos aprendido a calcular la velocidad media de los coches.
- ¿Cómo lo hemos aprendido? Ha sido superdivertido. Nuestro equipo nos pusimos en la calle. Medimos la distancia de 100 m y J. y M. se pusieron en un extremo y nosotros en el otro. Los otros días hemos comparado nuestros resultados en clase y los hemos discutido.
- ¿Qué he entendido bien? Tengo claro lo que es la velocidad media, que es diferente de la instantánea en un punto. También que siempre relaciona espacio o distancia con el tiempo. Y también que en esta calle la mayoría de coches van a 50 km/h o menos, o sea que lo hacen bien, pero uno iba más deprisa.
- ¿Qué cosas no acabo de entender? El profe nos ha hablado de los errores al medir, pero es difícil, aunque me ha quedado claro que es mejor tomar varias medidas y luego hacer la media. Lo que es muy complicado es lo de pasar de m/s a km/h y no digamos los factores de conversión. Espero que me vaya aclarando.

Co-Evaluation Activity: Activity to detect errors in the work of colleagues. It helps them recognise their own mistakes

Actividad de coevaluación

Cuadro 3. Ejemplo de actividad de coevaluación

INFORME DE UNA ACTIVIDAD EXPERIMENTAL					
Nombre del alumno que ha elaborado el informe:					
Nombre del alumno que le evalúa:					
Criterios de realización	**Criterios de resultados**	**B**	**R**	**M**	**Qué le recomiendo mejorar**
1. Pon un título.	Resume la experiencia y es sugerente.				
2. Identifica el objetivo principal del experimento.	Está de acuerdo con las finalidades del experimento y comienza con un verbo.				
3. Indica los materiales utilizados.	Se nombran todos y de forma correcta.				
4. Describe el procedimiento.	Se indican los distintos pasos de forma sintética. Incluye esquemas o dibujos.				
5. Describe las observaciones y los datos recogidos.	Se describen de forma sistemática, con la ayuda de tablas y gráficos.				
6. Justifica las conclusiones.	Las ideas son pertinentes y se relacionan con los datos recogidos y con la teoría estudiada. Se entiende bien.				

Summative and final evaluation: It is usually carried out at the end of the process and is typically an average of the data obtained from the students through the used instruments. It involves:

- ✓ Search a final Mark: It shows the degree of the reached learning objectives under evaluation criteria
- ✓ The objectives and evaluation criteria are strictly related
- ✓ To specify the evaluation criteria, it is necessary to define indicators or levels

A tool to carry it out: RUBRICS