



A Framework for Appraising Education

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Appraisal is the major performance management tool that is widely used to measure the efficiency and effectiveness of education in different contexts. In the European education environment, it has been recognized that the transition from learning to learning outcomes relies on developing appraisal frameworks that can appraise what a student knows, understands and mainly how to utilize what he has learned, as well as on evaluation frameworks of programs and in general of the educational approach. This paper has two main objectives. Firstly, it critically reviews the extant literature on student/program appraisal of the European education. Secondly, based on that review it presents a common framework for student assessment and program evaluation, which relies on four pedagogical issues: The PRACTICE applied, focusing on the students' knowledge achieved and on the design of the educational approach; the TOOL utilized that concerns the data collection and the data base creation; and the APPROACH in appraising, which includes the analyses performed and the time to materialize them. These three are creating a three-dimensional space, within which any aspect of the fourth issue, the NATURE of both the student assessment and the project evaluation, can take any position in this three-dimensional space.

Keywords: *Educational appraisal; student assessment; program evaluation; assessment and evaluation framework.*

1. INTRODUCTION

Learning appraisal is an important part of the education process and should be always utilized

when undertaking innovative activities. The notion of educational appraisal has often been described as a set of derived prescriptions on how to best manage education. More specifically,

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on one hand links the concept of strategic appraisal with human resources management expressed as the assessment of the human resources performance of the education stakeholders (students, teachers, administrators) [1] and on the other hand, the evaluation of the pedagogic programs in general and the curriculum in particular in an educational institution.

Appraisal, which is concerned and represents both sides of the same coin (students/educators), is considered a goal-oriented process [2], which is intended to ensure the operating educational processes aiming at maximizing the educational system's efficiency and effectiveness [3]. Thus, it should be used as part of a holistic approach to manage performance of the education stakeholders, mainly students, as well as the productivity of the educational approach. However, in recent years, the value of the traditional performance appraisals has increasingly been challenged in favor of building a different appraisal philosophy, which by necessity has to fulfil nowadays goals and objectives addressing the major issues of education.

Appraisal is not something new in education. Students are constantly assessed by their teachers; teachers are being judged and evaluated by their students, peers, and supervisors all the time; educational institutions are compared and evaluated by superior administrators regularly; and programs, curriculums and the educational approach to teaching and learning are always under review by society. All are judging and been judged and therefore there is a necessity to evolve an integrated and holistic appraisal system.

In short, appraisal is a tool in education not only to facilitate educational growth and development, but to follow accepted principles that can characterize the present education system (student teaching and learning and pedagogic program) in providing efficiency and effectiveness.

2. STUDENT/ PROGRAM APPRAISAL AND THE EUROPEAN EDUCATION

The European Commission responsible for policy has recognized that the transition from learning content facts to learning outcomes relies on

developing appraisal frameworks that can appraise what a student knows, understands and mainly how to utilize what he has learned, as well as evaluate the educational approach and programs. There is a rich literature on education appraisal [4,5], among them Serona et al. [6] have suggested a series of recommendations in formulating appraisal practices, which need to be reevaluated and reorganized into a new, to fit the present conditions, framework.

As a result, in order to establish an appropriate way to deal with student assessment and education process evaluation, there is a need to clarify some major issues, which are related to the chosen pedagogic approach and have an impact on the success of any appraisal. In examining the educational system, from a point in view as to how such an appraisal is regarded and how it can be accomplished, four major issues can be discerned.

2.1 The First Issue

The first issue is concerned with the understanding of the two aspects of appraisal, namely student assessment and education evaluation. Although in many instances these two terms used interchangeable, there is a basic difference.

2.1.1 Student assessment

It is concerned with the means of obtaining information for a specific purpose and therefore its goal is in understanding and improving student learning and teaching. As Shute [7] pointed out "assessment results can and should have important implications for instruction, positively influencing both the teaching and learning sides of the equation". In addition, however, in dealing with student assessment we should be aware that there can be assessment *for learning*, which is an approach focusing on what students actually learn from being assessed and assessment *of learning*, which is utilized to simply judge the students' work. This is a fine, but a paramount difference, leading to two important forms of student assessment:

2.1.1.1 Formative

It is a student assessment approach, which on one hand provides data on: Student learning; Addressing specific student learning difficulties; and Supporting learning growth over time. On the

other hand, it provides an understanding of what students know during the learning process and identify their strengths and weaknesses, as well as it encourages student's achievement [8]. As a result, it is used during the learning period and by both teachers and students.

2.1.1.2 Summative

It is the form of assessment, under exam conditions, used to appraise student learning, skill acquisition, and academic achievement at the conclusion of a defined instructional period (i.e., course, semester, school year, or program).

2.1.2 Project evaluation

This type of appraisal, on the other hand, takes assessment to the next level, that of judging the value and quality of learning performance within a specific end point and therefore it appraises student attainment of course outcomes and defined program competencies. As a result, it is concerned with:

2.1.2.1 Outcome evaluation

Educational outcomes are the short-term and intermediate changes that occur in students' learning as a direct result of the utilized teaching and learning approach. In addition, an outcome evaluation measures the educational results or outcomes related to changes at the individual and group level.

2.1.2.2 Impact evaluation

Educational impacts are the broader long-term changes that occur within a school, a community, an organization, and the society as a result of specific educational policies and approaches. Therefore, impact evaluation measures the difference between what happened with a utilized teaching and learning approach and what would have happened without it. In other terms, they examine the degree to which the changes observed in students learning occurred because of the specific curriculum used and in general the educational approaches applied. It utilizes activities that are focusing on process evaluation, which is formative in nature and examines the degree to which they are implemented and delivered as promised as well as produce the desired results.

2.2 The Second Issue

The second issue is related to the concepts of Unity and Uniformity. In Europe and especially

after the "Bologna accord" (although the accord was instituted for Higher education its application has been practically extended to all levels of education), there is an effort towards unity disregarding uniformity. These concepts can be defined as follows:

2.2.1 Unity

It is focused on the necessity to impose upon all educational institutions identical teaching and learning practices or curriculum structures. That is, to design a teaching and learning environment, which follows an educational norm created at the EU, at the national level, or at the regional level to provide educational institutions with an educational efficiency, in order to have equal treatment of all students.

2.2.2 Uniformity

It is concerned with the need to have an educational system providing educational institutions with an effective mechanism to transform their own identity into an instrument in designing their own teaching and learning practices.

2.3 The Third Issue

The third issue is concerned with determining the nature of appraisal as educational stakeholders by necessity are forced to move towards understanding and using technology in teaching and learning. There are two such approaches:

2.3.1 Technology assisted approach

It has been universally accepted that technology can be used to support educational appraisal [9,10]. It helps teachers to: Track student progress over time; Help boost engagement; Identify knowledge gaps; Create user data on assessment activities; and identify information about a student's needs and strengths [9]. But most importantly by combining data with learning analytics, technology assisted assessment can help students learn through their assessment and support further/deeper learning. In addition, technology assisted assessment, as Russell [10] has shown, is a good way to promote formative assessment practices in schools, because it provides the means to support feedback and correctives at each stage in the teaching and learning process.

2.3.2 Traditional approach

Traditional student assessment, has limited success for today's developments and conditions, especially after the boost of technological applications in education due to covid-19, and is associated with some form of standardized testing that uses questions with a limited number of answer choices, such as: Multiple choice; True or false; and Short essay answers.

2.4 The Fourth Issue

The last issue is concerned with the decision related to Qualitative and Quantitative approaches to appraisal. All educational research falls into these two broad methodological categories [11,12]. A very simple definition of these two approaches is:

2.4.1 Qualitative approach

In order to assess students or evaluate an education effort this methodological approach gathers data that are in free-form and non-numerical, and therefore are not coded using a numerical system.

2.4.2 Quantitative approach

In this approach the data gathered can be coded in a numerical form or the research relies on numerical data.

2.5 Appraising Student Learning and Program Evaluation

Understanding and knowing the following conditions represents a fundamental priority in any educational project. Because it defines the necessity for an efficient and effective appraisal approach, in order to understand the true issues involved in the student assessment and any educational approach:

- The conditions for comprehending the short-term and intermediate changes as well as broader changes that occur within the community, organization, and the society that play a pivot role in teaching and learning;
- The concept that any academic institution can offer educational opportunities and experiences, which are determined by their philosophy and culture, defined through their history, principles, values, policies,

management style, and most importantly the thinking and behaviour of their constituents [13]. In other words, provide for uniformity without unity [14], and local education stakeholders are becoming architects of their students learning;

- Accepting the fundamental principle that “*Technology changes, Education survives*”, which signifies the role of education as a societal necessity, but also the utility of technology towards that goal. Technological changes provide the power to fundamentally change the teaching and learning environment, In addition, learning appraisal by been associated with technology helps in formulating a necessary tool for the present day learning conditions;
- The issue of quality and quantity is of concern, because in approaching an issue is a matter of choice, for example, between how well someone completes something (quality) and how much he does (quantity). If someone is only completing one thing with amazing quality, as opposed to someone who has completed ten things in the same time with not as great of a quality, then there must be a choice, which is of paramount importance, especially in education;
- The social, emotional, and behavioural dimensions of learning, which lead towards improving children's outcomes, provide the power to the educational institutions to become the spaces that nurture their development.

In determining an appraisal approach demands the building of a different appraisal philosophy, which should include the previous set of issues and the attributes related to them. More specifically, it requires: choosing the Nature of the appraisal, which is expressed either by students' assessment or project evaluation; the Practice applied, which is represented by the dipole: unity or uniformity; the Tool utilized, as exemplified by the spectrum technology-based or the traditional evaluation; and the Approach in appraising, which in its fundamental form is related to qualitative or quantitative methods. These issues coincide with the “factors (that) are driving the increased use of evaluation and assessment” outlined in the OECD report “Synergies for Better Learning” and which are “very common themes” [15].

3. PROPOSED APPRAISAL CONCEPTUALIZATION

It should be evident that in determining an educational appraisal approach, a solid theoretical base is required [9,14,15]. Such a concept upon which to build any appraisal approach and based on the previous discussion, has four dimensions.

3.1 Nature of the Appraisal

In the first dimension there are two parallel processes: Student assessment and Program evaluation.

3.1.1 Student assessment

It is built on two principles: Formative assessment, which enables the teacher to see: how the student is evolving as a learner; and how to assist them [7]; and Assessment for learning, which involves teachers understanding of their students' progress; and how they use this information in order to enhance their teaching practices and further plan their instruction. Student assessment is focused on: Content/knowledge and skills acquired by the students;

3.1.2 Program evaluation

It includes the: Evaluation of the effectiveness of the questions asked; Question setting approach; Analysis of groupings of students (student performance in accuracy of answering, pace of completion or other common attributes). In addition, the program evaluation includes the investigation of key curriculum concepts and performing data mining to discover trends and other characteristics.

3.2 Practice Applied

The practice applied nowadays is that of uniformity [14]. More specifically, differences in teaching and learning approaches, pedagogies and curriculum structures are taking into consideration and dealt with, and the modifications required to make the approach effective is next applied. As a result, student and program aligned content has to be developed for each application, resulting in a set of questions matching the specific student and classroom teaching practice. It should be a basic goal of any appraisal that its various aspects to be first understood and clarified, in order for the

uniformity of appraisal of learning in these contexts to be demonstrated.

3.3 Tools Utilized

All programs nowadays utilize as appraisal tool the technology-based approach, which offers advantages over the traditional form. This tool, electronically built, can generate user and program data needed in any appraisal [9], which is its major contribution. In addition, such an appraisal, which by its nature is embedded in technology, can provide various types of diagnostic indicators for students (i.e., students' knowledge level and students' needs and strengths) and programs (i.e., the context of curriculum, and the educational approach). Finally, the technology-based tool can provide any set of specially designed questions and in the case of student assessment their feedback to nudge them towards the right answer.

3.4 Approach in Appraising

In deciding which of the two approaches (qualitative or quantitative) to student assessment and to program's evaluation should be utilised, the answer is not easy to make or objectively determined. Depending on one's viewpoint, experience, or preference, various opinions can be expressed regarding which of the two major approaches to education appraisal is better. It is suggested that the best answer to this dilemma is the one given by Tashakkori [16], who has written that "the original impetus for any educational research project, either qualitative or quantitative, springs from an initial recognition of a particular problem or concern, perhaps previously unidentified or insufficiently researched".

In sum, pedagogic appraisal demands the conceptualization and application of a new philosophy, which can be fully determined in a three-dimensional space consisting of the three major pedagogical issues, namely: the PRACTICE applied, focusing mainly on the design of the program and the subjects knowledge under assessment; the TOOL utilized that concerns the data collection and the data base creation; and the APPROACH in assessing, which includes the analyses performed and the time to materialize them, creating a three dimensional space, within which any aspect of the nature of the appraisal (any form of student assessment or program

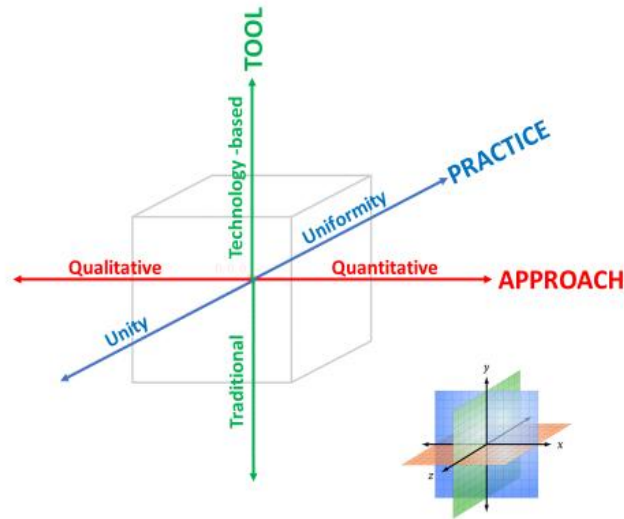


Fig. 1. Educational appraisal conceptualization

evaluation) can take any position in this three-dimensional space (as shown in the Fig. 1). This concept provides: a very efficient appraisal tool and a comparison tool differentiating appraisal (assessment or evaluation) approaches; helps any educational institution to recognize the context, in which it is operating; and in understanding the nature of student assessment or program evaluation.

4. PROPOSED STUDENT ASSESSMENT FRAMEWORK

4.1 Overview

The literature is rich on the subject of student assessment, its principles, its means and approaches, and the expected results [17]. Stassen et al. [18] defined assessment as “the systematic collection and analysis of information to improve student learning.” This definition captures the essential task of any student assessment of the teaching and learning process. In addition, it is important to recognize that assessment should be formative, in order to justify the *purpose* of assessment and not the *method*.

Along this line of reasoning, Clarke [19] stated that there is a need “to provide policy makers, development organization staff, and others with a framework and key indicators for diagnosis, discussion, and consensus-building around how to construct a sound student assessment system that supports improved quality and student

learning”, and therefore should be part of any assessment. Moreover, he has defined an assessment framework as a group of policies, structures, practices, and tools for generating and using information on student learning. Finally, Heubert and Hauser [20] explained that a basic premise of any assessment framework is that the right kinds of assessment steps and activities, and the right uses of data generated by those activities, are of paramount importance on improving learning and policy decisions.

Based on the literature and the three-dimensional space outlined previously an assessment framework is proposed, including the steps and activities within each dimension. In order, however, to approach this framework in a strategic way, we need to identify and qualify the key steps and activities, which provide an effective assessment system, as shown in Fig. 2.

4.2 Practice

This is the first dimension of the proposed framework’s assessment process and possess the following two necessary steps:

4.2.1 Design of assisting assessment technologies

The first step of this dimension is of paramount importance in any assessment process, because it determines its efficiency and effectiveness and should be part of any technology assisted effort. It includes the following activities:

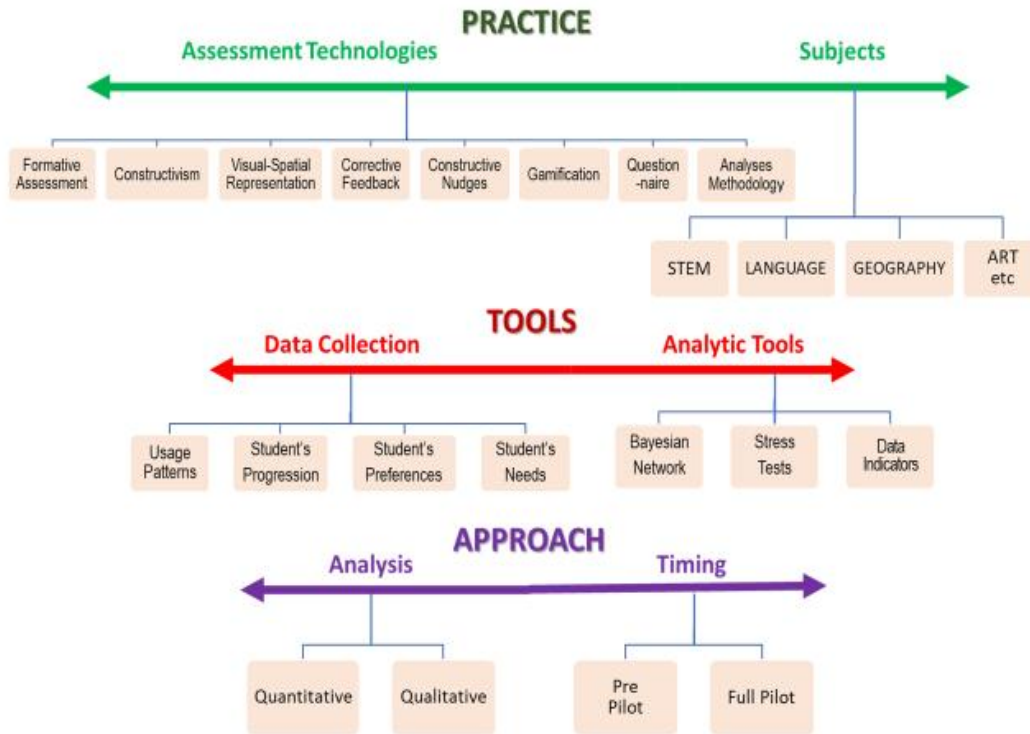


Fig. 2. Assessment framework

4.2.1.1 Formative assessment

As Russell [10] has pointed out Assisted Assessment Technologies can be designed to achieve formative assessment in schools, which Black and Wiliam [21] have defined as any interaction that generates data on student learning, in order to: Inform about teaching and learning; Address specific student learning difficulties; and Support learning growth over time. The Assisted Assessment Technologies by allowing the incorporation of text, animation, video and audio-visual information, not only provide these student assisting tools, but also helps teachers in many ways (i.e., reduce their time in grading, provide them a series of diagnostic instruments etc.). The danger of applying a formative assessment lies in using it as a surrogate summative or treating it as the means simply to appraise a students' performance, rather than assisting them and their teachers.

4.2.1.2 Constructivism

It is based on social constructivist educational philosophies [22,23] and emphasizes the

importance of interrelationships between persons participating in the teaching and learning processes and the kinds of interactions that need to be fostered in planning learning resources to create participatory learning experiences. In the constructivism approach, with the help of computer technologies, students by questioning themselves and their strategies, become "experts" on their own learning, providing them with the necessary tools, in the classroom or outside it, to keep learning or learn how to learn [24]. In designing any assessment, every effort should be made to carefully follow this educational approach as well as differentiate constructivism from constructionism, because these terms are loaded with social and educational concerns that create severe misunderstandings.

4.2.1.3 Visual and spatial representation

From a design point of view, the user interface is crucial, because as Galitz [25] has pointed out simple visual and spatial representation in design layout, which are combined with verbal information, can help users immensely in retaining operational concepts. In addition, this

“dual coding” helps teachers address classroom diversity, preferences in learning style, and different ways of “knowing” [26].

4.2.1.4 Corrective feedback

Assisting Assessment Technologies provide feedback, which is one of the most important tools in teaching and learning that simultaneously have a powerful influence on student knowledge and achievements. According to Hattie & Timberely [27] feedback can be defined as information provided by a teacher regarding aspects of a student’s knowledge and understanding. In this way, students are encouraged in their efforts in finding answers to the questions, to research additional information, but most importantly to be able to think more deeply through topics and concepts that are locally determined and culturally constrained.

4.2.1.5 Constructive nudges

Given that technology Assisting Assessment Technologies can provide carefully designed feedback for all correct and incorrect answers. It should be evident that this technology by nudging students towards the right answer, not only can educate them by reinforcing basic knowledge and conceptual understanding, but also introducing and teaching new concepts. It should be noted that nudges are an area sensitive to the local cultural setting (some generally designed nudges can be fully accepted by students in some countries, but in others might be offensive).

4.2.1.6 Gamification with incentives

Assisting Assessment Technologies include gamification elements, providing incentives and motivations. Most gamification efforts have been designed in order for the question sets addressed to students to provide the opportunity to achieve levels, credits and progress, which in turn require the existence of a scorecard. A credit system containing a scoreboard can help education stakeholders to understand if gamification techniques have positive or negative effects on students learning.

4.2.1.7 Questionnaire’s formulation

Questioning should be designed to build students’ knowledge base, which in turn can help deepen students’ conceptual understanding of any topic. Assisting Assessment Technologies, because of their nature, are designed to offer a way towards students’ conceptual understanding

of the topic under consideration. In addition, the questionnaire design of these technologies is an efficient and effective tool, but at the same time it represents a challenge to formulate it, in order to match national curricula and classroom teaching practice in various educational institutions.

4.2.1.8 Analyses methodology

Assisting Assessment Technologies by creating a full relational database, which is the result of collecting data concerning questions, answers and student progression allow student learning analyses to be practically an ideal analysis methodology. However, there should be a continuing adjusting of the provision of information and their analysis, by improving the question setting approaches (i.e., the identification of poor question sets, the performance of different types of students etc.).

4.2.2 Subject

The second step withing any assessment effort is the choice of the subject of the student’s assessment. With the Assisting Assessment Technologies, the subjects under examination can practically include most areas, but the important issue is the need for curriculum aligned question sets to be produced for each individual classroom.

4.3 Tools

The second dimension is focused on the necessary tools required in bringing into conclusion any assessment application and includes the following two steps.

4.3.1 Data collection

Assisting Assessment Technologies allow large sets of data to be collected by recording the students’ learning process. The most common data categories required in facilitating assessment are: Usage patterns; Student progression; Student preferences; and Student needs. By collecting such data, which lead to their analysis, the assessment helps teachers to: effectively manage a rich data base; monitor and record student progress, preferences and needs; and allow them to make timely decisions as well as reflect on and adapt their pedagogical strategies. This in turn, can lead to personalized learning pathways that facilitate pupils’ ownership of their learning. But most importantly it does it during the learning process rather than

at the end. There is an issue that needs to be mentioned, namely that determining the form and nature of the data to be collected depends on the identity of each institution, whose goals and objectives represent its own teaching and learning practices.

4.3.2 Analytic tools

Assisting Assessment Technologies can provide several analytic tools, ranging from Stress tests to Data indicators. Analytic tools allow teachers directly or indirectly to view their students' active use of the system and thus adjust their strategies to their student's individual learning needs. Their choice depends on the characteristics and peculiarities of each subject and curriculum.

4.4 Approach

The third axis of the proposed assessment framework is the approach in assessing students' learning. It is concerned with the analyses of the data and in deciding the time of their application.

4.4.1 Analysis

Any Assisting Assessment Technology by definition includes a relational database (a rich set of anonymized data) that contains information concerning questions, answers and student progression. This data base can easily become the source of a series of analyses, which are differentiated into two categories:

4.4.1.1 Quantitative

This is the major type of analysis of all assessment technologies, and is related to:

- *Content/Knowledge*, which the European Commission has recognised as a key factor in better equipping students with the knowledge they need to participate fully and actively in an increasing scientific and technological world.
- *Skills*, which express all aspects of competence, as defined by the European Commission, and indicates what the student should know and understand.

4.4.1.1 Qualitative

This is also a valuable form of analysis; it depends on the objectives of each educational program and is related to students':

- *Attributes*, which are an educational quality, character, or characteristic ascribed to students in order to explain their competences as being the result of their learning process
- *Behaviour*, which represents the way in which students behave in response to their teaching situation or stimulus.
- *Participation*, which represent student's action in response to classroom activities;
- *Personalized Learning Pathways*. In addition, through the analyses of student data for patterns and groupings, pathways can be created and the subsequent planning of alternative question sets for different groups of students can be achieved.

The results of all these analyses can supply teachers the tools to design the school program and create the classes in a way that will allow them to monitor student progress and homework assignments on an ongoing basis. Furthermore, teachers can use an analysis's results to share with other colleagues or parents their vision of how to support the learning opportunities of their students. Additionally, these results can allow students to: Monitor their own progress; Work independently and at their own pace; Appreciate feedbacks; Take action using feedbacks; Make judgements related to self-assess; Manage the effects of their teaching and learning; and Help handle the basic emotional dimensions of schooling.

4.4.2 Timing

The appropriate time to perform the analyses is a very important factor, requiring good planning. It is suggested that a two-step process is applied. The first step allows the design of the assessment to be evaluated, and the experience from this application (i.e., the technology and the question sets) can create a design that will support the final assessment approach and further enhance it. That is, the second step will apply all the features of the assessment for learning that were finalized in the previous step.

The transition from the first step to the second is a two-side process, one side of which is occupied by the results of the first step and the other side includes the demands imposed by the local application conditions. The reason is that there exist differences in terms of teaching and learning approaches, in pedagogies and curriculum structures as well as in the way

students can be motivated and incentivized. Therefore, these differences should be observed, recorded and dealt with in order to be modified and improved to make the application of the data collection and analyses to be based on the principle of uniformity.

In sum, any student assessment should be designed to: Drive student learning progression using well designed question sets; Help the students build their knowledge, skills and competences; Understand and support the investigation of key curriculum concepts and learning objectives; Provide feedback for all questions to help nudge the student towards the right answer; and Reinforcing basic knowledge and conceptual understanding.

5. PROPOSED PROGRAM EVALUATION FRAMEWORK

5.1 Overview

It is practically universally accepted that evaluations, in addition to assessment efforts, play a central role in teaching and learning [23,28]. There are several successful attempts by European countries to transform their educational systems using evaluation, or exercising the additional move from the student to the school system itself.

Patton [28] known for his work on education evaluation has defined educational evaluation as “a process that critically examines a teaching program and it involves collecting and analyzing information about the program’s activities, characteristics, impacts and outcomes”. That is, evaluation is related to objectives, learning experiences, learner appraisal and the relationship between the three.

As a result, any evaluation framework has to be based on three principles: First, there is a need to consider among others: Curriculum; Learning objectives; Desired faculty characteristics; Who define an educational program’s principles and values; How learning and the desirable qualities of educated people are assessed; The kind of leadership that is most effective; and the kind of professional development that is necessary to bring out the best in all educational stakeholders. Second, these considerations, in turn bring out the need to engage the minds of students, faculty, administrators and parents of academic institutions, towards a commitment to serve the family, the school, the community, the nation, and the world. Third, there must be an awareness of the need for an educational philosophical stand to get all education stakeholders to appreciate the necessity for educational reform, for higher standards and better student outcomes. This awareness is required to ensure that students obtain an educational experience which establishes the teaching and learning trajectory that determines and formulates their academic, physical, spiritual and civic responsibilities.

Based on these principles and concerns the following three-dimensional appraisal approach, outlined previously, an evaluation framework is proposed, which identifies and qualifies the key steps and activities in each of the three dimensions, providing an effective evaluation system, as shown in Table 1.

5.2 Practice

The first dimension of the proposed evaluation framework is as important as that of the assessment approach and includes, at least, the following set of activities:

Table 1. Program evaluation framework

PRACTICE	<ul style="list-style-type: none"> • Learning Progress • Quality Assurance • Curriculum and Learning Objectives • Stakeholders Engagement and Characteristics
TOOLS	<ul style="list-style-type: none"> ▪ Reflections of Partners ▪ Review of Deliverables ▪ Surveys of Project Stakeholders ▪ Checklists ▪ Examination of Outputs ▪ Activity Measures ▪ Indicators ▪ Analysis of Outcomes ▪ SWOT
APPROACH	<ul style="list-style-type: none"> ❖ Process Evaluation ❖ Outcome Evaluation ❖ Impact Evaluation

Table 2: Evaluation framework

PRACTICE	TOOLS	APPROACH
Learning Progress	Reflections of partners	Processes
Quality Assurance	Review of deliverables	Outcomes
Curriculum & Learning Objectives	Surveys of project stakeholders	Impacts
Stakeholders Engagement & Characteristics	Examination of outputs Activity measures Indicators Analysis of outcomes SWOT	Checklists

5.2.1 Learning progress

Learning progress or learning progression refers to the sequencing of teaching and learning and the descriptions of what students should know and be able to do at a specific stage of their education. Learning progress is categorized by subject area, and the level of students' knowledge and skills that students are expected to learn at a specific level of their intellectual, emotional, social, and physical development. There are two main characteristics of learning progressions: the standards/expectations at each level; and the sequence involved, such as the learning expectations for each grade level.

5.2.2 Curriculum and learning objectives

These objectives need to be evaluated in terms of their effectiveness, or they should be: Concise and understandable to education stakeholders; Feasible for education stakeholders to accomplish them; Encompass previous learning; Integrate and apply achieved knowledge, skills, and attitudes; Measurable cumulative outcomes/impacts at different stages.

5.2.3 Stakeholders engagement and characteristics

Today all education experts believe that involving stakeholders in the creation and evaluation of education policies is a sound practice. In other words, education stakeholders should have an input throughout the decision-making process, by participating in: Planning, which determines what decisions should be affected, who should be the participants, and what should be the questions to ask; Participation, which determines how to achieve learning from each other and setting priorities; Analysis, which establish approaches, methods and tools determining the course of

action; and Sharing, which encapsulates and distributes results to relevant, interested parties.

5.3 Tools

There is a variety of tools available to perform a program's evaluation, ranging from stakeholders' reflections and surveys to outcomes and output analyses or SWOT analysis. The choice and use of each one of the depends on many factors (i.e., the subject, the local conditions etc.).

5.4 Approach

The third axis in program evaluation represents the approach that involves education factors such as: Teaching program, which is concerned with assessing the effectiveness of teaching, Teaching strategies, methods and techniques; Curriculum, which is concerned with courses, texts and teaching materials; Society, which is focusing on the accountability to society; Parents, which is concerned with the need to inform and engage the parents. All of these can be evaluated through three evaluation approaches:

5.4.1 Process evaluation

This type of evaluation is focused on answering a set of questions such as: Who is involved? What activities or services are provided? How is taking place? when and how long?

5.4.2 Outcome evaluation

This form of evaluation measures the effect of an educational program by examining the extent to which the program produces the intended goals and objectives, expressed as: Effectiveness of the program; Attainment of its goals; Improvements achieved; Changes observed; Unintended outcomes. Outcome evaluation can

be: initial; intermediate; and long-term, as well as be concerned with the quality of the educational products; and the quantity expressing its application (i.e., completion, time spent etc.),

5.4.3 Impact evaluation

Educational impact evaluation assesses changes, intended and unintended, that can be attributed to a particular program or policy. In contrast to outcome monitoring, which examines whether targets have been achieved, impact evaluation is structured to answer the question: How an educational outcome would have changed if the intervention had not been undertaken? In other words, impact evaluation is concerned with the changes in outcomes that are directly attributable to a program, and represent an important educational evaluation approach aiming at: modifying attitudes or perceptions; and changing educational practices.

6. CONCLUSION

This paper, presented a strategic appraisal (student assessment and program evaluation) framework, which is based on a conceptualization of four major pedagogical concerns and whose steps and activities were identified and presented. It was shown that within a constructivism educational philosophy and the use of assisted appraisal technologies supporting formative educational approaches as well as the rest of the steps outlined previously it is attainable to : First, support the learning opportunities of students and allow them to monitor their own progress; Work independently and at their own pace; Appreciate feedbacks and take actions using feedbacks; Make judgements related to self-assess; Manage the effects of their teaching and learning; and Help handle the basic emotional dimensions of schooling. Second, provide teachers the tools to design the school program and create the classes in a way that will allow them to monitor student progress and homework assignments on an ongoing basis; Teachers can use the analyses results to share with other colleagues or parents their vision of how to support the learning opportunities of their students.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Huselid MA, Jackson SE, Schuler RS. Technical and strategic human resource management effectiveness as determinants of organizational performance. *Academy of Management Journal*. 1997;40;171-188.
2. Hselid MA. The Impact of human resource management practices on turnover and productivity. *The Academy of Management Journal*. 1995;38(3):635-872
3. Erez M, Kanfer FH. The role of goal acceptance in goal setting and task performance. *The Academy of Management Review*. 1983;8(3):454-463. Accessed 4 December 2020. Available: <https://doi.org/10.2307/257834>
4. UNESCO. The promise of large-scale learning assessments: acknowledging limits to unlock opportunities. Paris: UNESCO; 2019.
5. Kuh GD, Jankowski N, Ikenberry SO. Knowing what students know and can do: The current state of learning outcomes assessment in U.S. colleges and Universities. Urbana: University of Illinois; 2014.
6. Serova H, Sternadel D, Mašidlauskaitė R. Assessment practices for 21st century learning: Review of evidence, NESET II report, Luxembourg: Publications Office of the European Union; 2017. Accessed 4 December 2020. Available: AR1_20172.pdf (nesetweb.eu)
7. Shute VJ. Focus on Formative Feedback. *Review of Educational Research*. 2008;78(2):153-189.
8. Hattie J, Timberley H. The power of feedback. *Review of Educational Research*. 2007;77(1):81-112.
9. Nguyen Q, Thorne S, Rienties B. How do students engage with computer-based assessments: Impact of study breaks on intertemporal engagement and pass rates? *Behaviormetrika*. 2018;45(3):597-614.
10. Russell MK. Technology-aided formative assessment of learning: New developments and applications. In Andrade HL, Cizek GJ. Editors. *Handbook of Formative Assessment* London: Routledge. 2010;125-138.

11. Denzin NK, Lincoln YS. Handbook of Qualitative Research. Newbury Park: Sage; 1994.
12. Charles AT, Charles BT. Mixed Methodology: Combining Qualitative and Quantitative Approaches. Newbury Park: SAGE; 1998.
13. Aspire Academy. SOFIA Kick-Off Assessment Report. Doha, Qatar: Aspire Academy; 2016.
Accessed 4 December 2020.
Available: SoFIA (sofianet.org)
14. Koutsopoulos CK, Economou V. School on Cloud: Towards Unity not Uniformity in Education. British Journal of Education, Society & Behavioral Science. 2016;16(1): 1-11.
15. OECD. PISA 2012 Results: What Students Know and Can Do – Student Performance in Mathematics, Reading and Science (Revised edition). Paris: OECD. 2013;. Accessed 4 December 2020.
Available: <http://dx.doi.org/10.1787/9789264201118-en>
16. Tashakkori A, Teddlie C, Teddlie CB. Mixed Methodology: Combining Qualitative and Quantitative Approaches. Newbury Park: SAGE; 1998.
17. Suskie LA. Assessing Student Learning: A Common-Sense Guide. 2nd Ed. San Francisco, CA: John Wiley and Sons; 2009.
18. Stassen M, Doherty K, Poe M. Program-based Review and Assessment: Tools and Techniques for Program Improvement. Office of Academic Planning and Assessment (OAPA). Amherst: University of Massachusetts; 2001.
Accessed 4 December 2020.
Available: http://www.umass.edu/oapa/oapa/publications/online_handbooks/program_based.pdf
19. Clarke M. Framework for building an effective student assessment system. SABER working Paper. Washington DC: World Bank; 2011.
Accessed 4 December 2020
Available: <https://files.eric.ed.gov/fulltext/ED553178.pdf>.
20. Hubert J. Hauser R. High stakes Testing for tracking, promoting, and graduation. Washington, DC: National Academy Press; 1999.
21. Black P, Wiliam D. Developing the theory of formative assessment. Educational Assessment, Evaluation and Accountability. 2009;21(1):5-31.
Accessed 4 December 2020.
Available: <https://doi.org/10.1007/s11092-008-9068-5>
22. Holmes BT, FitzGibbon B, Savage A, Meehan S. Communal Constructivism: Students constructing learning for as well as with others. Proceedings of SITE 2001, Florida, USA. Accessed 4 December 2020.
Available: Communal constructivism – Edu Tech Wiki (unige.ch)
23. Fowler C, Mayes J. Learning relationships from theory to design. In Squires D, Conole G, Jacobs G, editors. The changing face of learning technology. Cardiff: University of Wales Press. 2000;39-50.
24. Koutsopoulos KC, Papoutsis P. School on the cloud: Transforming Education. Education Policy Analysis and Strategic Results. 2015;11(1):31-47.
25. Galitz W. The Essential Guide to User interface design: An introduction to GUI design principles and techniques. New York: John Wiley & Sons; 2007.
26. Johnson D. Teaching outside the lines: developing creativity in every learner. Newbury Park: Sage; 2015.
27. Hattie J, Timberley H. The power of feedback. Review of Educational Research. 2007;77(1):81-112.

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