Procedures for Evaluating the Teaching Process in Computing Disciplines

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Abstract. This study attempts to create a standardized procedure and defines the responsibilities for evaluating the teaching process in computing disciplines. International quality assurance criteria and Jordanian Higher education Accreditation committee standards are used as tools that direct the creation of the procedure. We proposed a new procedure flowchart for evaluating educational process and solve the responsibility conflict to successfully and continuously execute the proposed process in universities. The practical adaptation of the proposed procedure for evaluating the teaching process in the universities and the new approach of mechanism to determine the distribution of tasks and responsibilities ensures that the principles of continuity and follow-up with the objective of continuous development and improvement of the teaching process, and guarantees achievement the best and efficient results of evaluating process.

Keywords: Computing Disciples, Evaluation Criteria, Quality Systems, Procedures Measurement, Teaching Process.

1 INTRODUCTION

The evaluation process is the most important among other processes such as planning and implementation to the success of the learning process and development. Evaluation is an organized collection of information that is valid and reliable, effective and appropriate analysis of the degree of this information to set standards for the goals set in advance to take appropriate decisions thereon [1]. Information subject to evaluation could be measurable quantity facts as the number of students and the exact results of examinations; also it may be difficult to measure as opinions, attitudes and perceptions.

The commitment to the principle of continuous evaluation and follow-up of the teaching process in order to study the obstacles and devising solutions is necessary to be of interest to find out the steps that have been implemented and the extent of approaching or distancing itself from the objectives that were set. Range of evaluation methods and techniques, tools and standards according to the objectives of which purports to achieve, and often the target of the evaluation decision is taken

depends on the evaluation results, given the seriousness of some of the decisions based on the results of the evaluation which requires the adoption of standards agreed with the evaluation goals [6].

In the last decade, many changes have been taken place on the evaluation concept reflected on all elements and components. Evaluation previously confined to the learning outcomes of the learner, but now and after it became central role of interest to quality assurance in educational institutions, the concept of the evaluation expand duties to include evaluating the teaching process as a whole: study plans, course content, learning resources, learning and teaching methods, competencies of the teacher, educational environment and education outputs.

2   PROBLEM BACKGROUND

Institutions of higher education face three problems when we talk about the evaluation which needs analysis to develop practical solutions to avoid or overcome these problems are:

2.1   Poorly Qualified Faculty Members

In higher education institutions faculty members oversee the three stages of teaching process: Planning, implementation, and evaluation. If they have the scientific competencies and academic planning with high efficiency and ability to implement distinct skills, problem remains in lack of knowledge and know-how to achieve required evaluation process [1],the reason was the absence or lack of educational training necessary for them when they have been hired.

2.2   Partial Use of Measurement and Evaluation Tools

In higher education institutions practical tools of measurement reduced to a single tool. We mean tests and rarely used a second tool as questionnaire (www.ed.gov/pubs/OR/Consumer Guides /perfasses.html, 2011). This, in turn misses the concept of comprehensive educational assessment for the operation of the entire teaching process which is end up by evaluating registered students only.

2.3   Do Not Specify the Procedures and Responsibilities

The absence of clear documented procedures for all evaluations to be achieved, and do not define responsibilities for each element of the teaching process, adversely affect the achievement of the evaluation to its objectives and substantially impair the principle of continuity and follow-up principle effective in completing the cycle of continuous development and improvement of the quality of the learning process [2].

The researchers offer an effective way to address the above problems and set out documented and effective procedures to evaluate the teaching process and evaluating all elements simultaneously and in several stages, presented their vision of the process to link the measurement and evaluation and follow-up through the mechanism of action and clearly defines the responsibilities shared by all.

3   EVALUATIONS AND MEASUREMENT

Concepts of evaluation and measurement seem interdependence and close links with each other, but represent independent concepts separate from each other in the foundations and principles, tools, standards and objectives (ISO, 2005). So you must know the limits of the each concept and determine their respective roles in the evaluation and follow-up processes, allowing effective planning is subject to the application of results in improving the quality of the teaching process, regardless of the element or attribute to be evaluated.

The concept of evaluation is the most comprehensive and broader, evaluation proceedings take measures include measurements of the initial stage of evaluation stages; measurement describes the behavior (output) and a quantitative description. Evaluation adds a qualitative value of this quantity [5]. Although more objective, measurement of the evaluation, but less than the value of the educational aspect. Assessing the results in the specific criteria already allow their interpretation and take the appropriate decision.

Test or exam is a means or a tool of measurement and evaluation numerous tools such as Interview, questionnaire, problem analysis, performance evaluation, and report analysis. Although the test is the most common means being a systematic procedure for measuring a sample of education behavior (output) aimed to determine the level of student achievement and skills in any learned subject by answering sample questions [7]. It remains a limited tool effectiveness and scope of assessment of students without the elements of other teaching process.

Figure 1 illustrates the process of evaluation procedures that rely on the following four sequential stages:

2.1   Planning stage

Building an integrated plan include actions to be implemented to achieve a goal or set of predefined objectives and linked to the category (attribute) the subject of evaluation, as determined responsible for each activity within this procedure, and the targeted standards, tools and forms to record data and results. In this stage, issuing work instructions that include methods and techniques for compliance during the following stages of the evaluation.

3.2 Measurement stage

At this stage, it is assigned a specific measurement reverting to the instructions on the tools and methods set forth and which is determined by the end of evaluation operations and ongoing operations of the target group in the evaluation. Keen to document measurements and results in the forms delivered to them before the start of implementation.
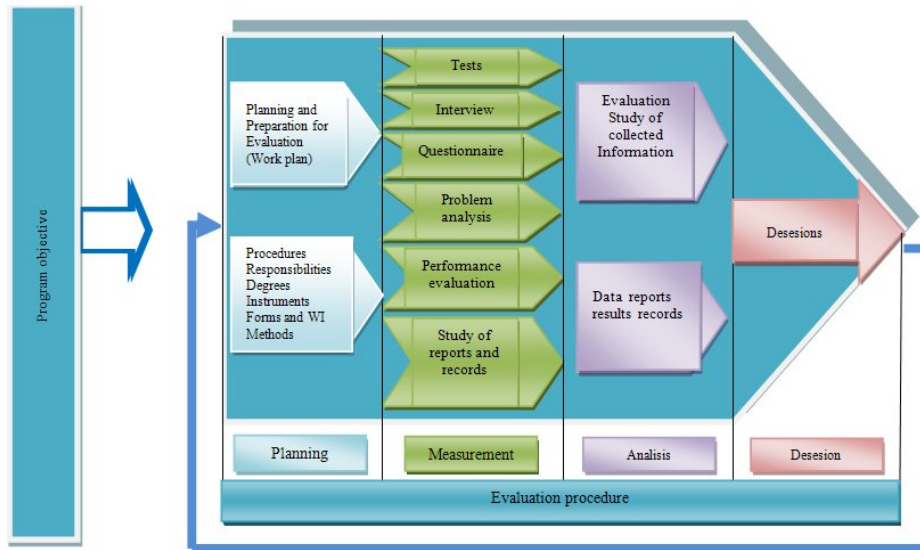

Figure 1. The process of evaluation procedures

3.3 Analysis stage

At this stage, is the collection, codification and tabulation of data resulting from measurements are subject to a study to be analyzed and interpreted the interview with the criteria set in advance, allowing the sentencing based on the conclusions after analyzing the data, reports and records and the results of the measurements.

3.4 Decision State

Which is the final stage of the calendar, wherein provisions are employed in making appropriate decisions to achieve the goals of assessment processes aimed at improving the performance and resources and results of the race evaluation entry.

4   EVALUATION CRITERIA

A criterion is the measurement standard or level or performance, and is evidence of evolution, or check the required condition, associated with the used tool and the evaluation goal. To assess the process of study in higher education institutions we must deal with four types of calendar, each of which has its standards, and tools and which fit with the end of evaluation operations. Table 1 shows the relationship between the type of evaluation, its goals, its tools and its standards.

The need for four stages of evaluation and follow-up to the process of teaching and the accompanying diversity of tools and standards imposed by a set of principles and fundamentals required specifications of the learning process which is intertwined with the factors and influences overlap would make identifying the relationships and interactions between the elements of the teaching process in a very difficult and complex, some of these fundamentals are:

4.1   Continuity

The process of evaluation to be an ongoing process associated with the teaching process in its early stages in the planning and design of programs of study and during implementation and after completion of the implementation and follow-up long-term impact of the outputs of the learning process.

4.2   Comprehensiveness

That includes the evaluation of all elements and components of the teaching process, Evaluation must be covered by the plan of study and sources of education and learning, as well as the principles and criteria for selection of teachers, the level of performance among teachers and learners, the environment as rooms, equipment and laboratories, studying aids, and others.

4.3   Diversity

Learning process evaluation through the use of tools and multi-media evaluation such as questionnaires, observations, tests, interviews, case studies, problem analysis and study of records and reports.

4.4   Participation

To participate in the evaluation process all affects and affected by the process as administrators, faculty members, students, graduates, community and professionals, to detect the strengths and weaknesses in the teaching process and its stated objectives

4.5 Follow-up

To extend the evaluation to include the actual impact caused by the teaching process to the graduates themselves in their ability to give graduates the necessary competencies and skills to develop their performance and professional career and its impact on society as the beneficiary of the outputs of the educational institution.

Table 1. Evaluation types used in the evaluation of the teaching process

Evaluation type	Goal	Tools-The target group	Standard
Initial evaluation	Determine level of students, level of techniques and resources available in the teaching environment.	Tests- new students Interviews-Student teachers	Test results, trends measurement people opinions, results comparison
Formative evaluation	Follow-up implementation of the program, level of achievement among students, teachers level of performance and take advantage of learning resources.	Reports-Environmental teaching aids Questionnaires-teachers and students, Tests-Students Performance evaluation-School	Test results, measurement of trends, people opinions the level of performance
Summative evaluation	Final evaluation of the verification program and estimate the level of student achievement.	Exams-Students Questionnaires-Students Reports-Teachers	Test results, The measurement the level of performance
Follow-up evaluation	tracking the effects of long-term program	Problem Solving-graduates Interviews-those employing Graduates, Questionnaires-the alumni, community groups	The level of performance Number of people who got a job in their field? Number of people who have pursue of higher education? Number of people who have achieved professional successes

5   PROCEDURESANDRESPONSIBILITIES

The researchers proposed a model for action evaluations of the process of teaching and delineation of responsibilities involving the largest number of faculty members and those involved in the evaluation process, after they apply this model in the faculty of science and Information Technology at Alzaytoonah University of Jordan where the researchers working.

Research based on the system theory to build the evaluation model and follow-up to the learning process so as to cover all elements of the teaching process: inputs, processes, and outputs, and build on the principle of feedback to achieve the monitoring and control to guide the teaching process within its intended route to achieving the goals set in advance.

Figure 2 shows the mechanism for the implementation of the process of evaluation procedures suitable for use regardless of the element to be rectified or the type of evaluation that is required. The proposed model features has the following properties:

•   Cover all the processes required to achieve the evaluation operations, starting from the study and planning processes through the measurement and then the analysis and conclusion and finally making the right decision based on facts and findings

•   Model is based on the feedback at each step of the evaluation to ensure the highest levels of quality and ensure standards of integrity, objectivity and scientific and rely on the facts in the planning, implementation and measuring effectiveness, and who fulfill the principle of focusing on process and output and not just gross

•   Model achieves the principle of pluralism in the use of measurement tools and methods of assessment according to the purpose, goals and needs, stated the evaluation process should be done and to ensure validity and reliability, flexibility and most importantly to achieve justice

•   Available in the form of a high degree of oversight and control processes to achieve the conditions and quality control standards, and ensure continuous improvement and development assessment processes that leave the impact of a clear and dynamic at the level of performance and the results of the teaching process in higher education institutions

The most important element in achieving quality procedures for evaluation is the human element responsible for the planning, implementation and follow-up, which must meet a number of attributes and has a range of knowledge and experience to perform this role. The lack of training and preparation for faculty members to carry out the functions of evaluation is not sufficient. Most importantly, the additional time and effort provided by the faculty member for the success of the evaluation and continuous monitoring of the process of teaching.

Researchers provide a solution to the issue of defining the responsibilities for the implementation of measures evaluation by taking advantage of the working committees of the academic departments, in addition to its other tasks are distributed tasks, operations, evaluation of activities to achieve the best results. Table 2 shows the mechanisms of this practical solution to achieve the greatest

degree of effectiveness in achieving the objectives of the various evaluations of the components of the learning process.
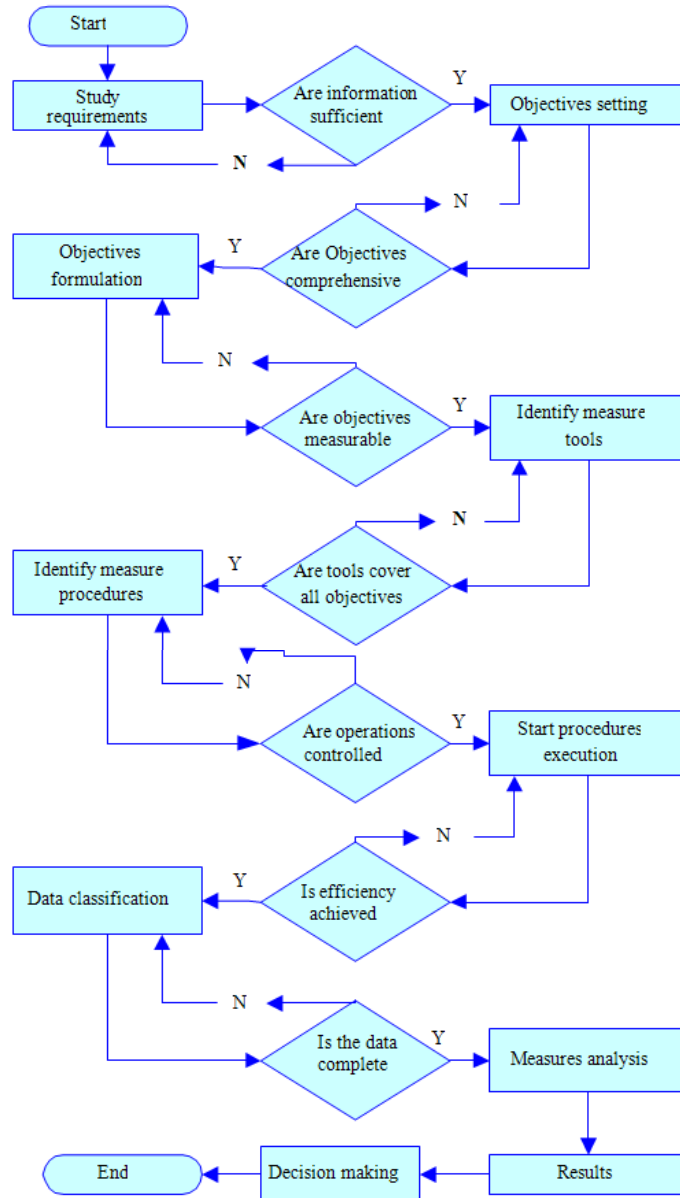

Figure 2. Outline of evaluation process

The proposed solution achieves a set of features and specifications that must be provided in the assessment processes and helps to raise awareness of the importance of the evaluation, and a culture of participation of all employees and beneficiaries of the results of the evaluation in educational institutions, and the most important specifications guaranteed by this solution:

5.1 Participation

All faculty members and some students are members of these committees, and they have a role in the ongoing assessment processes.

5.2 Integrative

The distribution of the evaluation on the various committees and a central control and follow-up lead to the integration of results and promotion of the principle of reciprocity.

5.3 Comprehensiveness

All elements of the teaching process is subject to ongoing evaluations during and after the process to achieve its objectives and mission.

5.4 Democracy

All influential and affected of teaching process and its results are informed participants and tuned to the ongoing assessment processes and outcomes.

5.5 Continuity

The stability of the role of the working committees despite a change of individuals, which ensures continuity of evaluation operations, which achieve the principles of follow-up and efficiency.

Table 2. Responsibilities in the procedures for the operations calendar

Name of Committee	Assessment Tasks
Quality assurance committee	Planning control, implementation and effectiveness evaluations and the development of mechanisms
Planning and learning resources committee	Evaluation of programs, study plans, academic content and learning resources.

Scientific and academic activities committee	Evaluate teacher's performance: academic, scientific and organizing.
Examinations and evaluation committee	Evaluate the student's performance, their educational attainment and the level of acquisition of skills
Computing and e-learning committee	Assessing teaching aids and methods of and teaching environment specification
Graduates Follow-up Committee	Impact assessment a long-term process of teaching in the community

6   MATERIALS AND METHODS

Research reviews the mechanisms and evaluation criteria and stages for the evaluating purposes of the teaching process in higher education institutions, and identify problems and obstacles that prevent achievement of the evaluation to its objectives, and provide practical solutions to overcome these problems and improve performance and increase efficiency to achieve the highest standards of quality of the teaching process through the provision of a universal model for the conduct of the evaluation operations and to provide a new vision in determining the tasks distribution and responsibilities to all concerned in evaluation processes.

7   RESULTS

In this research we found two solutions to provide complementary approaches to the success of the evaluation, and achieve quality standards in higher education institutions to assure that the principles of continuity and follow-up with the objectives of continuous development and improvement of the teaching process, these two solutions are:
•   General model of evaluation operations suitable for use with different types of evaluation, and achieve the goal of the evaluation of various elements of the teaching process to ensure totalitarian and objectivity
•   A mechanism to determine the distribution of tasks and responsibilities and participation of all in the planning, implementation and monitoring operations to assure continuity and efficiency to achieve the best results.

8   DISCUSSIONS

Discussion focuses on three aspects involved in evaluating model of teaching process in universities: How? partial use of measurement and evaluation tools, Who? procedures and responsibilities are not specified andpoorly qualified faculty

members,When?, evaluation methods and techniques arelimited to student achievements and annually evaluation reports. Researchers offer an effective way to address the above problems and set out documented and effective procedures to evaluate the teaching process and evaluating all elements simultaneously and in several stages, presented their vision of the process to link the measurement and evaluation and follow-up through the mechanism of action and clearly defines the responsibilities shared by all.

9   CONCLUSIONS

The practical adaptation of the proposed procedure for evaluating the teaching process in the universities and the new approach of mechanism to determine the distribution of tasks and responsibilities ensures that the principles of continuity and follow-up with the objective of continuous development and improvement of the teaching process, and guarantees achievement the best and efficient results of evaluating process.

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