Measures of Transforming the Summative Assessment in Formative Assessment in Students Activities Evaluation at Constanta Maritime University

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Abstract

Traditionally and within theoretical approaches, examiner’s report on courses at final exam in the universities consists of two components: firstly, there is a summative assessment where a judgment is made on a thesis that has met the standards established by the discipline for the award of the degree; second there is a conception about the development and the formative aspects of the exam, where examiners provide feedback to assist the students to improve their learning tasks. The main objective of this paper is to determine if periodically exams ‘students are primarily assessment or feedback? In this paper it is used feedback term referring on the trajectory of professor-student reports, in an effort to distinguish it clearly a summative assessment form. The small-scale study of four examiner’s reports aimed to identify the nature of them and whether the reports provided are primarily summative assessment or feedback.

Keywords: Feedback, assessment, evaluation process, quality in education

1. Theoretical background: assessment and feedback

Educational process and training processes would not be evaluated and focused on performance without feedback. Feedback is considered the most important factor within the learning process (Clynes and Raftery, 2008). Without feedback, the chances that a student progressing, to close the gap between current and desired performance and to attain the level needed to become a member of the academic community are lower (Strake and Kumar, 2011).

A stronger focus on feedback would improve, for all stakeholders involved in the educational process, the quality of the higher education. Some literature review was determined regarding the definitions and interpretations of feedback. Usually, the common definition is that feedback is an interactive process which aims to learners with insight into their performance. Notwithstanding the evidence that feedback is a determinant component of the student learning process literature review was examined regarding barriers to giving and receiving feedback, personal relationships between professor and students and how the preparing feedback process seems.
There are some factors which influences the understanding of student’s response to feedback. Students’ self-esteem, relationships in the workplace and the expectations of the learners, are factors which influences the receiving of feedback (Young, 2000). Teachers as trainers need to be cognizant of the relationship between self-esteem and receipt of feedback. Studies reveal that students with high self-esteem have the ability to appreciate the constructive comments and understand that the information relates to performance. Conversely students with a lower self-esteem tend to interpret constructive messages as negative communication strokes and perceive them as personal messages.

One of the main consideration in communication is that given feedback is not always the same with the feedback received (Koh, 2007). The information that professors regards as a comment on performance may be perceived by the student as a personal slight. In order to assess how the information has been received by students during feedback session, it may be useful to have a summary discussion which students are encouraged to reflect on the feedback and to outline their interpretation into this context. The relationship and the category of stimulus transferred between the sender professor and the receiver teacher are influenced by the relationship between two of them. When students respect and appreciate the professors’ activity, they are likely to value the information (Giilespe, 2002). In addition, this type of relationship, professor/student may encourage the student to seek feedback regularly. Jerome (1995) describes feedback process as delivering in four different stages. Initially, teacher and student have to work together to establish learning objectives as feedback will eventually base on these. Wherever professors have to deliver negative feedback, they have to use sandwich technique (Dohrenwend, 2002). This method consists of providing negative sandwiches feedback between two specific pieces of positive feedback; it is particularly useful when working with junior students and with students with low self-esteem. In an effective communication between professor and student it is not always essential that all praises and criticisms needs to be sandwiched and on occasion it may be more appropriate to offer praises and criticisms independently. Mature students do not appear to be overly concerned with the manner in which feedback is given; younger students, regarding to studies, seem to be more sensitive to criticism. Wiggins (1998) describes the importance of the specific character of feedback: being well descriptive and actually occurred. Information presented to students should be clear and offered in terms of specific targets and standards. Feedback should focus on evaluating behavior and work performance and not on the different characters of students (Russel, 1994; Dohrenwend, 2002).

The process of delivering feedback is considerably easier for the professors’ activity, when the student identifies his own practice limitations (Clynes, 2008). That’s why students should implement their own self-assessment before giving feedback; students’ ability in evaluating their own performance shouldn’t be underestimated in
the educational process. The process of delivering feedback is always easier when students identify their own theoretical and practical limitations.

1.1. Assessment and evaluation process activities in professor-student relationship: Summative assessment

Examiners may consider the examination as a gate keeping task or/and as an opportunity to provide developmental experiences to the candidate. Examiners encourage developmental experiences in the form of feedback (Kiley, 2009) and usually make a summative judgment within the examination process. Professors prepare in evaluation activities a summative assessment where examiners make a judgment whether the thesis has met the standards established by the discipline and the university in order to award of degree. There is another important element in professor-student activity, a development and formative one, where examiners provide feedback to assist student to revise and improve his work in future evaluations (Kumar and Stracke, 2011).

A conceptual definition of assessment refers to how much learning has taken place as a result of teaching (Gibbs and Simpson, 2004; Kumar and Stracke, 2011). Assessments are considered learning outcomes, whether the outcomes meet the standards that have been established. In this sense, assessment provides information about a performance. The performance standards are usually listed as assessment criteria or usually classified as guidelines for examiners. Examiners verify if certain learning outcomes have been met. One of the learning outcomes of the students is the capacity to make an original interpretation of the course’s information and to consult scientific literature indicated for the course. If the student has promoted this criterion, the assumption is that the objective of this outcome has been met. Even if the examination criteria are made available to the examiners, examiners may interpret the criteria based on their own scholarly understanding and interpretation. These elements are influenced by the notion of hidden curriculum by which examiners assess the learning outcomes. Professors should be evaluated on the atmosphere they create in the classes and the degree of trust they have established with their students. The hidden curriculum of university starts in each individual class. Faculty should have the opportunity to discuss their school’s hidden curriculum at length, as a whole group, because it will bring them closer to alignment with their core ethical values and agreed practice on the ground.

Another different conceptual understanding of assessment emphasizes the view of assessment as an educational measurement; it has been developed the concept that assessment is a measure of competence. The notion of assessment refers to any appraisal, whatever it is called judgment or evaluation (Sadler, 1989), and it supposed to serve two purposes: summative and formative.
Summative assessments are those assessments given at the end of semester/program or mid-semester with the sole purpose of grading or evaluation progress. Summative assessment indicates to professors and students if the learning goals have been achieved. If results of summative assessment of performance are reported, it is a passive measure of improving performance, because it doesn’t have a direct impact of learning (Sadler, 1989).

In contrast with summative assessment there is formative assessment, which is given with an opportunity to direct improve the task of learning. Formative assessment incorporates different components:

- Diagnosis students difficulties
- Measuring improvement over time
- Providing information to improve tasks of learning.

One of the main objectives of this article is to improve students’ assessment from Constanta Maritime University and transform summative assessment in a formative one; formative assessment is active in the sense that it triggers and provides a sense of direction to achieve learning goals. The distinction between summative and formative evaluation could be very clear interpreted: summative assessment make a judgment call on learning outcomes while formative assessment provide a sense and a direction to achieve unattained goals.

1.2. Formative assessment / feedback in students’ evaluation process

One of the proper interpretations of the feedback is that it provides developmental experiences and encourages self-regulated learning. The main aim of feedback is to reduce discrepancies between current understandings, performance and a goal. Feedback is a fundamental aspect of teaching and learning. Authors like Rowntree (1987) describe it as “lifeblood of learning”. One of the aims of this article is to outline the nature and the importance of feedback in formative learning environment.

Formative feedback in exam’s evaluation of students is an unbiased, analytical reflection of what was occurred. Both formal and informal methods of delivering feedback to the student exist. Ideally a combination of these methods should be used in order to ensure offering of correct information. One informal method of feedback is to on-the-spot comments, which are made during practice. These could be used especially for the practical aspects which were evaluated by professor. This feedback can be called, opportunistic which is a vital experience for the formative learning experience.

A second informal method of feedback provided by the professor is a general conversation with students away from the job. While this technique may enhance the collegiality, its value is uncertain. The distinction between summative and formative assessment is clear: summative assessment makes a judgment call on learning outcomes, while formative assessment provides a sense of direction to achieve unattained goals. If
the information which professors send it to students has a direct impact on the learning
tasks established within the analytical program of the discipline, it can be considered
feedback or formative assessment. If information sent by professors does not have an
immediate impact on learning, it is summative assessment. So, feedback can be defined
as a trajectory move towards attainment of a learning goal.

In this study, it is proposed to improve formative feedback in the students’
evaluation process within Constanta Maritime University. The central goal is a proposed
data base, accessed by each student where he can find the summative assessment for
each discipline and advice for improve quality of learning, starting from the learning
tasks which haven’t been reached.

John Burton defines a series of eight human needs that are based on the idea of
feedback from the others. The human needs are:

- need for response from the others (and therefore consistency)
- need for stimulation
- need for security
- need for recognition (by the individual obtain social confirmation that the his
  reactions to stimulation coming from the company are relevant and approved)
- need for specific judgment (not enough that the answers he receives only
  individual only to be consistent, they must be consistent with the experiences
  and expectations)
- need to be perceived as a rational person (which stems from the need for
  consistency of response that an individual receives from the others, rationality
  points out that there are the others who need a consistent behavior)
- understand the need for consistent received response
- need for control.

Based on Maslow’s idea that the threat of unmet need creates considerable
tension in the individual, to imagine what can cause in organizational neglect by both
the employer and the employee of these human needs based on feedback. People are
attracted to the idea of the whole, complete, will understand the events that happen
every day and have principles that gives order and therefore predictability. The activity
of a component depends not only by employed "to do", but by the component "evaluate"
and "improve".

If you work out an employee is not evaluated and the result of evaluation is not
communicated in a comprehensive manner to the employee, he may experience a
voltage generated by unmet need for response from his boss. If this lack of response
persists, depending on personality, the employee may manifest as: outbreak (explosion) or toward the attack of himself inwards (implosion).

In both cases it is dealt with a frustrated employee who, over time, can become very irritable (without being able to name the exact cause of his irritability state) and that will end the relationship with the employer or organization physically leaving or staying, but "absent" from the point of view of his participation (especially of the creative one). Lack feedback place an employee in a state of confused stagnation he does not know if his efforts are adequate enough or it is necessary for the boss to notice.

When the employee receives feedback, whether positive, negative or neutral, he/she is already placed in a more secure environment than when the feedback is not known. He feels free to choose his next move and has the feeling of belonging to a transparent working environment, the predictability of actions do not feed free of tension/stress.

The idea of feedback inhibition may create unjustified situations. Many who should provide feedback forget or do not understand that feedback means a sentence like: “You did a great job! Thank you! “Or” During the meeting, you made the transition from one topic to another, not sure if anyone has additional comments made”, and concludes with result from the complex evaluation process. It is very important for the employee to feel that his work is recognized in any form and that this recognition has continuity. If he repeated, the employer shall give to his employees positive feedback, it should lead naturally and a gratification of his efforts, expressed as a change of function, by assigning new responsibilities and increased compensation or even form of performance-based bonuses.

Without this continuity of feedback, not estimated an employee may feel ignored or even useless for the company where he works. It is true that it is very difficult to give a negative feedback and also it is hard to get. Many times, the poor performance of an employee can have many causes and both partners in question must be aware of this and, if possible, eliminate them. There is, however, a solution to avoid negative feedback if it is just for avoiding stagnation means, and this hinders the development of solving / improvement

Feedback should be provided when performance is at a certain level, be it negative or positive. There are employees who, in the absence of feedback, especially in the absence of the negative one, imagine that their work stems from the standards required by the employer.

It's a lack of respect for the employee to claim at the end of a year of activity, that the performance was low, as long as during that year no one warned about the quality of his service. Speaking of feedback, it means the attention which an employer knows or not to grant it to his employee and thus the attention manifested by the employee to
employer. The employee becomes increasingly "invisible" for the employer; the chances to seek the satisfaction of this need to be noted in another company are growing. Many times, chiefs defend this threat through lack of time; they pay more attention to themselves than to their people. Here the need for formative evaluation feedback is present not only in the student - teacher assessing, but also in the management processes in relations manager – subordinate.

2. PERFORMANCE MEASUREMENT IN THE TEACHING PROCESS

2.1. Assessment in the Educational Act

Assessment, within the instructive-educational process, is necessary to be considered an attempt to know own students, to find out the nature and the quality of what they learn strengths and weak points of the educational act, but also students' aversions and interests or even their style to learn. From here it can be interpreted that the result of the assessment represents the knowing of the student. The way this result can be interpreted and used, it is the problem where the answer is sought in the following argumentation.

The main objective of the assessment is to give feedback in the students and teachers process. Generally, this aspect is given for less importance, especially from teachers, even though this part is one of the most important within the educational process, indicating the way student perceived the educative process. The learning assessment involves student’s performances. In a learning process there are three types of assessment like: formative assessment, summative assessment and diagnostic assessment.

The formative assessment is realized during the learning process. Its purpose is to assess the student’s progress during this process development. This can be made on account of a continuous assessment.

Summative assessment represents the general assessment of the way the objectives of the education act have been achieved. This type of assessment is used at the end of a stage within the learning process (written or oral examinations, practice strategies). As far as this type of assessment is concerned, it is referred to most common assessment ways: assessment through multiple choice tests and tests with questions demanding a developed answer.

As far as the diagnostic assessment is concerned, it positions the student according to the knowledge at the beginning of the learning stage. Within the summative assessment, it can be realized, according to the results if the purposes have been accomplished. Now it can be established if a multiple choice test is correctly accomplished, helping to achieve the teacher’s purpose, if it can be improved, if any sequence, any question or any subject contributes to the wrong answers of the students, if the teacher’s activity can lead to wrong answers. In this respect, the analyses
techniques of the subjects can help to give us answers from this point of view.

Revising the multiple choice tests involves the use of statistic methods with an ambiguous use. Generally, these methods are used to assess the assessment efficiency through the observing of the difficulty level of questions and of elements producing error.

Statistical methods will be used in order to identify improper construction of the tests used in assessing students at the Constanta Maritime University, specialization Economic Engineering in Transport. Thus the methods used will help in evaluating students, trying to formulate the end, based on the results and some suggestions for teachers that make their training.

The study was conducted on a sample of 100 students pursuing courses of this specialization following the results of these four disciplines covered by them. First it is tried hereinafter to establish an indicator for the four disciplines: Difficulty level = Number of wrong answers / total number of responses. In the figure below the subjects were summarized in note intervals obtained for the sample analyzed.

Figure 1: The subjects in note intervals

A difficulty of over 70% can be considered an answer to a difficult question while a difficulty below 30% is considered an answer to a trivia question. Such difficulty levels obtained at disciplines analyzed varies between 7% and 20% (GM1 = 6.9%, GM2 = 10.2%, GM3 = 11.6%, GM4 = 19.6%). This indicates that either the students aren’t very well prepared or tests were well prepared or so they were able to achieve satisfactory results.
The difficulty of questions within a test can affect the discriminatory power of the test. Such tests in which questions are strongly related, questions have a discriminatory power of 50 %, and it is recommended that the questions in the questionnaire have a difficulty level between 20 and 80 % and the lightest in terms of motivation to position at the beginning of the tests. For cases of a small sample (30 %) the results may be quite inaccurate so it is recommended to supplement these without having any influence on them, as \( W; W=\sum W_i \).

Next, they built a second indicator called in the following index that it indicates discrimination of splitting the sample analyzed in two categories: students well trained and less qualified students. It will use all the results of students who performed the analysis for the four subjects studied by them. Initial test results are arranged in groups of grades and subjects, and are divided into groups of equal size (about one third) of their total number. Thus for each question: Discrimination index = (score of well-trained students - score of less qualified students)/Number of students in the group of well-trained or poorly trained people.

![Figure 2: Discrimination index of respondents](image)

This index \( D \) can take values between 1 and -1 indicating that a test can be divided into two categories, weak and well trained students, it is crucial for the whole test. Entire test is taken as a criterion of the assumption that broader sampling of content and educational objectives will provide a better shootout between well trained students and weak students. Also index of discrimination can be determined using a score for the entire test. The results of analysis are summarized in the table below:
Table 1: Index D scores

<table>
<thead>
<tr>
<th></th>
<th>$D_{M2}$</th>
<th>$D_{M3}$</th>
<th>$D_{M4}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.309091</td>
<td>0.257575758</td>
<td>0.244444</td>
</tr>
</tbody>
</table>

Thus obtaining a value above 0.4 for the index of discrimination is considered effective in time. 0.2 values are inefficient. Indicators previously calculated G and D are used for building reliable and valid tests, considering the degree of difficulty is also strongly affected by the credibility factor and distracters, which should be removed if possible.

Improvement of the test questionnaires can be achieved in efficiency analysis distracters, their choice is independent of students' interest, and so good distracters may be of interest much higher for poor students from the most qualified and also be chosen and corresponding proportion of students who are divided into categories.

Examination of difficulty, efficiency and discrimination distracters allows the teacher to identify and correct weaknesses or give to that question. Such questions allow the teacher to analyze and improve the ability to build tests, evaluating the effectiveness of testing methods for evaluating strengths and weaknesses of teacher and student as well as in the future created valuable questions that can be used in evaluating students.

A performance criterion that indicates learning or not mainly depends on professional experience of the teacher evaluator. And generally can be used criterion score. In general the results of these tests are between 70-80 %, and if certain tests have to be above 50 %, generally between 60-90 %. Professional skills of the teacher evaluator dependent on processes mentioned above, the level of feedback as well as his experience in the evaluation of the course and its subjects.

Correlation is defined as a measure of the strength of association between two variables, where I researched survey correlation exists between the 4 materials to verify the hypothesis that if students get high marks for a subject they will get satisfactory results for other material. The correlation coefficient is within the range -1 and 1, and can help interpret the graphs and indicating the degree of scattering between variables (subjects) analysis. Analysis of correlations between the subjects studied by students as part of the sample is shown in the table below, and used as an indicator, Pearson correlation coefficient.
Table 2: Pearson’s correlation coefficient scores

<table>
<thead>
<tr>
<th></th>
<th>Pearson</th>
<th>0.692789</th>
<th>0.577466</th>
<th>0.565696</th>
</tr>
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<tbody>
<tr>
<td>m1</td>
<td>m2</td>
<td>0.5692788533</td>
<td>0.769556</td>
<td>0.894671</td>
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<tr>
<td>m2</td>
<td>m3</td>
<td>0.57746589</td>
<td>0.769556</td>
<td>0.720836</td>
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<tr>
<td>m3</td>
<td>m4</td>
<td>0.565695653</td>
<td>0.894671</td>
<td>0.720836</td>
</tr>
</tbody>
</table>

As noted in the table above for all possible combinations of the materials studied are obtained positive values for Pearson correlation coefficient which can interpret by the fact that obtaining satisfactory or unsatisfactory results for field generates automatically the same results and other matters.

**Standard score**

In general training and educational institutions used for marking the trained scale between 0 and 100 points, the promotion is done if you get more than 50 points. Thus, if the results from one discipline compares with the results of other discipline is important that they provide signals scattered in the same direction, otherwise the comparison is not justified because of e.g. 50% of a test can be much higher than 80% of other test. Equalization’s spread of results obtained by different sample subjects most often using the normal distribution method. Results are presented in the table below. Thus to say that a student who obtains a score with a standard deviation above average (for an example if material M1 where the average is 6.79) will get better results than 88% of students examined.

Table 3: Standard score for questions M1, M2, M3, M4

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
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</thead>
<tbody>
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<td>0.038462</td>
<td>0.03252</td>
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<tr>
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<tr>
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<td>0.050505</td>
<td>0</td>
<td>0.089431</td>
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<td>0.222222</td>
<td>0.153846</td>
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<tr>
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<td>5</td>
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<td>5.818182</td>
<td>6</td>
<td>5.788618</td>
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<td>S. D.</td>
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<td>1.356466</td>
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Table 4: Method results for questions M1, M2, M3, M4

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<tr>
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<th>M2 Point</th>
<th>rank</th>
<th>M3 Point</th>
<th>rank</th>
<th>M4 Point</th>
<th>rank</th>
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</thead>
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<td>7</td>
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<td>18</td>
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<tr>
<td>S.D</td>
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<td>73.08727659</td>
<td>22.95103484</td>
<td>58.25900026</td>
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z-score

- 0.220685188 -0.73884269 -0.31952081 0.671331656
- 0.310965492 -0.75252496 -0.36309183 0.122060301
- 0.682117853 -0.32837453 -0.75523101 0.152575376
- 2.036322414 1.231404482 0.464757548 0.324222675
- 1.043239069 1.258769026 2.381882432 1.319777005
- 0.220685188 1.450320835 0.334044487 1.731730521
- 0.762367012 -0.49256179 -0.23237877 0.602672736
- 1.123488229 -0.75252496 -0.75523101 0.945967333
- 1.123488229 -0.87566541 -0.75523101 1.186273551
mean 4.93432E-17 2.46716E-17 4.93432E-17 7.40149E-17
S.D. 1.060660172 1 1 1

Next it was built so-called Z-score indicator which indicates the performance of students in the subjects studied by them, which causes the score expressed by the standard deviation from the mean.

Thus Z-score = (score-average) / standard deviation
As can be seen from the data previously obtained the main disadvantage of this indicator is that its average is 0, yielding even negative values of the scores. So it is necessary to build another indicator to correct this shortcoming, with a mean and a standard deviation preset. Newly created pointer will cause the Z-score’s multiplication with the average standard deviation and adding their values fell up to the teacher examiner.

Thus Standard Score = Z-score * 15 +50

Table 5: Standard Scores of students

<table>
<thead>
<tr>
<th>Standard score</th>
<th>46.68972218</th>
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The results can be compared. Comparing the results with the standard tests can convey very different perceptions of reality. It can be said that the teacher give high marks for encouraging students to attend that course.

5. Final Considerations: Assessment Through Multiple Choice Test vs Assessment Through Questions with Developed Answer

The problem of subjectivity (or the lack of objectivity) concerning the assessment process will not be completely removed, but it can be kept within acceptable limits, through the establishment of clear grading criteria, a lack of objectivity in valuing a paperwork or the subjectivity of an accurate presentation or not. Another problem appearing in this assessment form the situation where there are two or more assessors of paperwork and between their appreciations there are inconsistencies.

As far as the assessment through multiple choice tests there must be realized the fact that an efficient assessment is hard to conceive, as it is required a careful accomplishment of the questionnaire, an accurate target-group, an efficient implementation and an elaborate analysis of the results. In the assessment process the multiple choice tests must be used occasionally, they must be short and simple. In order
that such tests are efficient, they have to be submitted to the following criteria: the asked questions must be essential; the questions must be easy to understand; an emphasis upon closed questions to lead a choice of more alternative answers; avoiding subjective answers, the questions must be short and precise.

Moreover, an efficient assessment test must take into account the following criteria: avoid figure results, eliminate irrelevant questions, avoid vague and unclear questions, it should not contain exaggerate questions; avoid ambiguous questions, to give student enough time to offer feedback.

The assessment represents a necessary on standard deviation, an element of the instructive-educative process. It gives account of the availability of the educative-instructive process and leads to performance accomplishment. In this respect, the assessment process must have a careful and efficient analysis.

This analysis involves taking into account a series of elements functioning as measurement factors of this process. These elements are; the power to make a difference of a question, the discrimination index, misleading elements, normal distribution.

The success of every educational and instructive activity is measured through the assessment process interpretation, that is why it is imposed the need of an adequate understanding and correct interpretation of this process, leading to performance, that will be translated in visible results and within the job that the student-a future employee will play in the work field.

Transforming summative assessments in formative assessment is an objective of implementing quality management in Constanta Maritime University. Positioning students in the center of the educational process can be achieved only under conditions in which students perceive that they are learning objectives that they have mastered and which ones should be reviewed. The two types of needs: the need for recognition (by the student obtain social confirmation of the fact that his reactions to stimulation coming from the company are relevant and approved) and the need for specific judgment (not enough that the answers it receives student just be consistent, they must be consistent with the experiences and expectations) cannot be satisfied only by implementing formative assessments, feed-back.

Conclusions

The assessment represents a necessary on standard deviation, an element of the instructive-educative process. It gives account of the availability of the educative-instructive process and leads to performance accomplishment. In this respect, the assessment process must have a careful and efficient analysis.

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