

LEARNING EVALUATION IN TECHNOLOGICAL HIGHER EDUCATION: FROM TRADITION TO NEW PARADIGMS

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Abstract. *The objective of the present article is to reflect upon the issue of evaluation, in the technology related courses, in higher education. It reviews both on national and international literature, in order to show the need for a change in pedagogical attitude, so that evaluation is seen as a process and not as a product. It starts with the assumption that if university professors, in technological areas, propose changes on the traditional evaluation model, they will have to rethink their teaching practice, and this will foster an increase in the quality of the classes, redefine the role of the teacher in the formation process of the background of university students. At the end we point towards a few paths that the teacher may take in order to break loose from this classificatory evaluation concept.*

Keywords: *Evaluation of learning, Technological education, Higher education*

1. Introduction

When we search the literature to find the basis to explain learning evaluation, we see that there is a large number of writers concerned with evaluation and teaching-learning process issues. However, we notice that concerns about evaluation in the level of elementary education are stronger than that for higher education. Because of that, as Godoy (2000) points out, when we propose an analysis of the meaning and effectiveness of the process of evaluating learning at a higher level, we must necessarily review the international production in the area, particularly, the one represented by the North-American and British perspective, which Vianna (1995) acknowledges as the most influent worldwide.

Differently from what has been reported earlier, in this paper we propose to seek input from both national and international works to help us in a reflection, which may justify an eventual change in the evaluation of learning paradigm in higher-level courses, including the technological areas, such as engineering. We emphasize that Brazilian authors have shown interest in developing research in the area of evaluation of learning in Brazil. This makes our analysis somewhat more realistic as opposed to a work made from an all-foreign bibliographic sources.

To clarify our position, it is worth to point out that, in our teaching practice in graduation, regardless of the nature of the course, we have seen that the traditional evaluation model has prevailed in some teaching areas.

According to Caldeira (2004), the traditional evaluation model is strongly associated with the development of technical and behavioral theories, which became important in the 60's. For the author, such theories ascertain the effectiveness of the learning process of evaluation according to "expected behaviors". Therefore, for a long time, efforts have been dedicated to producing tests, inventories, questionnaires, behavior record cards, etc. For decades, the evaluation of learning has become an instrument for analysis of final performance.

Contrary to higher education, efforts have been made at elementary education level in order to overcome this model of evaluation (SOUZA, 2004). For this author, at this level, we observe an attempt to look for processes to better diagnose students. On the other hand, we cannot say the same about higher education, as mentioned before, since "evaluation in higher education seems to be the area where there is more resistance to change" (Sousa, 2004, p.131).

At this teaching level, Souza understands that the criticism made so far to traditional evaluation practices has reached at least some of the courses in the area of human sciences. However, we cannot point out very significant changes, as we have seen the use of instruments of quantitative learning check in BA courses. This reflects the mechanical conception of evaluation, as is the case of multiple-choice tests, which still have an important role in the evaluation system of these courses.

According to the above, one could argue that, if there are difficulties in the implementation of changes in the evaluation process at higher level courses of human sciences, it would likely be much more difficult to implement such changes for technical courses, such as engineering. The worst part is that, in addition to maintaining the current evaluation models, the existing process is more related to the pedagogy of testing than to evaluation itself, having significantly broader dimensions. In this regard, we agree with Luckesi (2002) in the understanding that the use of learning evaluation is connected to the process of disciplining students. According to the writer, "the use of tests as a way of threatening students has, by itself, has nothing to do with the meanings of school contents, but rather with pupils social discipline under the patronage of fear" (Luckesi, 2002, p. 21-22).

In order to better understand this model, we can highlight the work developed by Tyler (1949), one of the first theoreticians on this subject, who regarded educational evaluation as a continuous comparison between students' performance and previously defined objectives. In this same line of thought, we agree with Caldeira (2004) that the work by BLOOM, HASTINGS and MADAUS (1971), *Manual de Avaliação Formativa e Somativa do Aprendizado Escolar* (Manual for formative and additive evaluation of school learning) has especially influenced education planning throughout many generations. In that work, the authors suggest that there are three functions of evaluation, namely: diagnostic, formative and additive, which were incorporated to the works of several authors discussing this subject, including Luckesi (2002), Haydt (1995) as shown in the table below:

Table 1: Evaluation Functions

Formative	Takes place during the learning process. It is designed to correct failures in the educational process and to provide alternative ways to recover from such learning failures.
Additive	Takes place at the end of the process, with clear objectives of measuring results.
Diagnostic	Takes place before and during the learning process to group students according to their difficulties at first, and at the end to identify whether there has been progress toward learning the contents taught.

Source: HAYDT, R.C.C. *Avaliação do processo ensino aprendizagem*. 5 ed. São Paulo: Ática, 1995, p.19.

We understand that evaluation models used up to this date need to be rethought, because we cannot conceive evaluation as an instrument of social selectivity, as it has been. However, we believe that this will only be possible if we rethink the teaching-learning process. Teaching and learning cannot be dissociated. And this new way of thinking classes, represents, in some cases, a change paradigm. It is significant to point out that evaluation must reflect the reality

of the school classroom, and not be an instrument for excluding, classifying, sanctioning and punishing, as reported by Aedo (1996) apud Barros Filho (2002).

2. Evaluation and the Teaching-Learning Process

As emphasized by Barros Filho (2002), evaluation is probably the most regulated and the most ambiguous area in education, whether at elementary or higher level. Because of that, the author contends that there is a large discrepancy between teachers' discourse on evaluation and their real classroom practices. In this context, even without knowing the reality of all courses, it is impossible to disagree with his point of view, because as a School Performance Evaluation teacher in the Pedagogy course, which forms teachers to work in the early years of the Elementary School, it is possible to see that reality is not different, although we would expect it to be. As a result, we question once more the difficulty to evaluate students in technical courses.

As a result of what was stated above, we may have the impression that we are not fit for the changes in paradigm of the evaluation criteria in technical courses. But we believe that it is an urgent need. What we are justifying is that for this to happen, it is necessary that classes also be restructured. In this regard, we agree with Haydt (1995, p.21) "if evaluation allows us to directly verify the level of students learning, it also allows us to indirectly determine the quality of the teaching process, that is, the success of that teacher's work". But it requires that the teacher understands the evaluation as a process and not as a product, and that it appraises students rather than just examining them.

Veiga (2004) understands that evaluating is establishing a relationship. For this to happen, the author states that the relation is processed by the interaction between two differentials pointed by Dalben (2004), namely: the ideal parameter, constituted in the referential for quality control; and the supposition of reality itself, as perceived by the individual/evaluator.

For the author, by taking this perspective as a reference, the evaluation process relies on the type of relationship that teachers establish with the school, and on the referential built which will guide the selection of criteria or indicators of the evaluation process. Moreover, the author states that, "evaluation is a reflection on the quality of the pedagogical work both of teacher and the students" (PASSOS, 2004, p.24).

When we understand evaluation as a process and not as a product, we agree with Veiga (2004), that the didactical process under the relational perspective means to analyze its characteristics from four different dimensions: teaching, learning, researching and evaluating. We are aware of how difficult it is to use this process, but we believe that if we intend to evaluate our students and make our classes even more significant, we should rethink our daily practices to achieve higher teaching quality. Bazzo (2001) also supports this point of view. According to the author, the search for teaching quality must include a profound revision of the evaluation processes to which students are subjected, especially the technological area.

When we discuss higher education evaluation, especially in the technological area, we believe that a reflection on the nature of such evaluation may provide the support for the use of new teaching methodologies in the classes of these courses, leading to a more significant learning process. On the other hand, as proposed by Bazzo, we understand that a new attitude towards evaluation systems does not imply a weakening of the requirement levels in the learning process, neither a reduction of the workload for the construction of knowledge. On the contrary, we share the author's views in the sense that such change actually depends on a more rational use of the knowledge construction time, the disruptions that the teacher, as a guide of the teaching-learning process, needs to introduce to motivate his/her students, in order that they develop new skills. Moreover, for this to be possible, the teacher must have the ability to evaluate the level of cultural capital students bring into the classroom, and build, with them, the knowledge from that point on, and not from an ideal level, which has been unilaterally and previously determined by the teacher. Finally, we cannot forget that the success of this process also relies on the use of technological artifacts that may be used as teaching aids to facilitate the learning process.

3. Final Considerations

To finish these considerations, we believe that when evaluating a student, the teacher needs to abandon the classic scheme of questions and answers, right or wrong, of classificatory evaluation.

We should have in mind that evaluation is used as a tool for mediation and overcoming actions. We expect that activities designed are able to generate effective and significant learning. We understand that when a student feels he/she is responsible for building knowledge, within a significant context, learning interest increases without the need for an instrument to force students to study. Even because, as supported by Luckesi (2002), the evaluation, by its own construction, is not designed to be a "definite" judgment about something, an individual or a situation, because it is not a selective action.

It is not about preparing activities and expecting the delivery of exact reproductions, but to design them in a way that is significant, so that the pupil can engender his/her development by way of his/her achievement.

Just as evaluation, building knowledge is a process; it does not happen by chance, or overnight. Therefore, evaluation should not be seen as isolated from this process, it has to be part of its construction, as a mediator. Learning and evaluation walk side by side.

As a result, a teacher should not be authoritarian, but cannot fall into a “*laissez faire*” attitude. He must be democratic and responsible.

Therefore, it is up to the teacher to ensure that everybody participates in the class, working from previously experienced situations, mediating whenever necessary, for this is very important for the construction of knowledge.

To evaluate, the teacher must know how to listen, look, feel and understand the ways through which students express themselves. Evaluation must be continuous. It needs to take into consideration the processes lived by the students. It is important to take into account that there is a wide variety of answers from students and that such answers can be altered, depending on teacher's intervention, which should always be designed to foster knowledge.

It is our understanding that evaluation is a comprehensive process, which implies critical deliberation about practice, as a medium to emphasize advancements, locate resistances and difficulties, and make it possible to take action to overcome obstacles. Thus, its undeniably important that instead of right and wrong, as in the traditional system, teachers make comments about students tasks, helping them identify their difficulties, offering them the opportunity to find better solutions. This applies both to human sciences and to the technical area, with adaptations to each specific context.

Therefore, a mistake cannot be seen as student failure, but as an alternative to restructure new formulations from such mistake, a constructive error. Hoffmann (2003) believes that the knowledge produced by a student at a given time in the student's life experience, is knowledge undergoing a constant advancement process.

Teachers need to be aware of what their plans are (clear objectives) and always think about the achievements and difficulties a student has had, so that they can better intervene and help students progress in the learning process. There is no way to deny that such point of view may be difficult to be adopted by teachers who believe in the traditional pedagogical tendency, that is, the teacher as the center of the teaching-learning process. But if a teacher plans to change his teaching practice and adhere to Luckesi's view (2002), so that pupils may grow while learning; and so that learning and development are intentional, then intentional teaching will also be necessary.

Therefore, if a student has difficulties, there should be something leading to it, and it is up to the teacher to check and take action in order that these difficulties are overcome. If the student has no difficulties, it is up to the teacher to mediate new achievements, that is, redirect his/her class.

Another aspect we consider to be interesting to include is that, despite the fact that we are teaching adults; we cannot attribute the failure exclusively to the student, because we understand that several elements need to be taken into account and not just student performance. In this regard, the student responsibility for building his/her knowledge, as well as the teacher's role in mediating such construction in a responsible and intentional, way are undeniable.

Finally, if it is up to the teacher to mediate such construction, he/she cannot evaluate in a static manner and from time to time, as previously established, while the student continues to be seen as an object in a process. However, we can observe that evaluation is the matter that has brought more resistance over time, and even more when we speak about higher education, not only because of its traditional history, which is very strong, but also because of our society, which is classificatory in itself. Therefore, we need to break away from the classificatory evaluation concept, as it generates social selectivity and does not promote students' growth.

4. References

- BARROS FILHOS, Jomar. (2002) Avaliação da aprendizagem e formação de professores de física pra ensino médio. Tese (doutorado) em educação – Universidade Estadual de Campinas.
- BAZZO, Walter Antônio. Qualidade de ensino e sistemas de avaliação. Disponível em < <http://www.engenheiro2001.org.br/artigos/Bazzo.doc>>. Acesso em: 26/02/05.
- CALDEIRA, Ana Cristina Muscas. Avaliação da aprendizagem em meios digitais: novos contextos. Disponível em < <http://www.abed.org.br/congresso2004/por/htm/033-TC-A4.htm>>. Acesso em: 20/02/05.
- GODOY, Arilda Schmidt. Avaliação da aprendizagem no ensino superior: um estudo exploratório a partir de opiniões dos alunos do primeiro e do último ano de três cursos de graduação. Revista Administração OnLine. Vol.1 nº1 Jan/Fev.Mar.2000. Disponível em: < http://www.fecap.br/adm_online/art11/arilda.htm>. Acesso em: 26/02/05.
- HAYDT, R.C.C. Avaliação do processo ensino aprendizagem. 5 ed. São Paulo: Ática, 1995.
- HOFFMANN, Jussara Maria L. Avaliação mito e desafio: uma perspectiva construtivista. 32 ed. Porto Alegre: Mediação, 2003.
- LUCKESI, Cipriano Carlos. Avaliação da aprendizagem escolar. 14 ed. São Paulo: Cortez, 2002.
- SOUSA, Clarilza Prado de. Avaliação do aluno do ensino superior em sala de aula. Anais do XXI ENDIPE – Encontro Nacional de Didática e Prática de Ensino – Curitiba, 2004, v.1 p. 131-138.
- TYLER, R.W. Basic principles of curriculum and instruction. Chicago: The University of Chicago, 1949.
- VEIGA, Ilma Passos Alencastro. As dimensões do processo didático na ação docente. Anais do XXI ENDIPE – Encontro Nacional de Didática e Prática de Ensino – Curitiba, 2004, v.1 p. 13-30.

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