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In the history of college teaching, pedagogical concerns completely dominated the educational scene from the mid 70's to the end of the 90's. As shown by Laurin (1998), who studied the concept of teaching content at college over a period of 30 years, and through ten official documents, there is a constant tension between the concepts of content and pedagogy.

As a professional who has been involved for a long time in the continuing education of college teachers, I can say that student-centered pedagogy has been the sole focus of professional development and support since the 80's. In my daily work as an educational advisor, I considered teachers as experts on content and believed that it was better to allow them full latitude in their own fields and try instead to draw them into my field of expertise, which is pedagogy. Problems relating to content and those relating to methods were therefore treated in parallel fashion and remained independent of each other.

Since the Reform, i.e. the imposition of competency-based programs and the institutionalization of program evaluations, major projects devoted to the development, implementation and evaluation of programs have been carried out in colleges. For several years now, one of the core tasks of teachers has consisted in discussing program content and making strategic decisions with regard to content choice and organization from both a program and a course perspective. Teachers are therefore faced with didactic questions but, in most cases, have not clearly identified their relationship to the knowledge associated with the competency matrix of the program of studies.

However, the fact remains that, in their daily professional activities relative to courses and programs, teachers find themselves developing and practicing college didactics simultaneously. They are thus placed in an implicit action research situation.

We began our research at the start of the 21st century in order to detail the didactic work being done in colleges and to develop educational activities centered on the relationship to knowledge. We are members of a PERFORMA task force¹ whose goal is to help develop the didactics of college teaching. This article is an attempt to describe the frame of reference developed during our research during our research and, more particularly, resulting from the work undertaken with teachers within educational activities. It introduces the components which make up the frame of reference. These components form a set of concepts that can be used as the basis for didactic questioning in technical and pre-university training as well as in general education.

WORK PLATFORM

This frame of reference is recreated in the most methodical way possible, allowing us to view the various components that support the practices of teachers in college, and other elements that require further investigation or even critical discussion.

Our first question is: **What are didactics?** Let us begin by saying that to answer this question properly, we should keep in mind what distinguishes didactics from pedagogy. To define didactics, I refer to remarks made by an early didactician, Vergnaud (2001, p. 273) who states: "Didactics consist in studying each stage of learning and highlighting the important role played by the teacher as a mediator between students and knowledge. From the epistemology of disciplines to the statements put forth in cognitive psychology, the object of analysis is the overall process that builds the relationship to knowledge." On the basis of this definition, we can deduce that the problematics underlying didactics deal essentially with the RELATIONSHIP TO KNOWLEDGE, whereas basic questioning on pedagogy is focused on the TEACHER-STUDENT RELATIONSHIP. We should avoid placing didactics and pedagogy at opposite ends however; they are complementary processes that, like it or not, the teacher must accommodate concurrently. However, until now, didactic questioning on the relationship to knowledge has not received the attention it deserves and this is why I wish to emphasize this aspect here.

So **what is this relationship to knowledge?** The relationship of an individual to knowledge, whoever he may be, is his relationship to the learning that takes place in his life, his way of being and acting faced with what there is to learn, in the world in which he lives. (Charlot, 1997, in Jonnaert and Vander Borght, 2003). In the case of a teacher, the relationship to knowledge is the representation he has of his discipline, the understanding he has of the program of studies and its teaching content, and the connection he establishes between his discipline, the teaching content and the knowledge of his students.

¹ The task force includes: Francine Authier, Nicole Bizier, Lise Lapierre, Louise Leblanc and Françoise Ruel.



Consequently, at the beginning of our research, we identified a **basic orientation**: To place the teacher at the heart of the matter or, more precisely, target the knowledge he has concerning teaching the subject matter. To do this, we consulted American research on pedagogical content knowledge². This choice led us to adopt the perspective of SUBJECT, i.e. the perspective of an individual who within his professional teaching situation, constructs his acquired knowledge in direct relation to the subject matter taught. On the other hand, we also drew upon French-European research that favours knowledge as the starting point of research and intervention. Our work platform therefore, places the teacher at the centre. Let us elaborate further on this point.

In college, teachers develop programs (design, implementation, evaluation, and revision), build courses and do research, three typical professional situations. In particular, when constructing or rebuilding programs or courses, teachers are faced with choosing the content. Their decisions must take into account the following three dimensions: the finalities, the relationship between these finalities and the contents taught and the references or sources that support this content.

► FIRST DIMENSION: FINALITIES

I am referring here to the finalities of curricular knowledge, that is knowledge to be taught, and in the last analysis the program finality. The programs specified by the Ministère (ministerial specifications) in technical training, pre-university training and general education, are formulated in terms of finalities, goals and competencies (objectives and standards). The term finality includes the three stages mentioned previously (Raisky, 1999). All things considered, the finalities, goals and competencies are part of the specification aspect of programs.

Even though a core of teachers has contributed in all cases to the development of the competencies listed in ministerial specifications, there remains much work to be done locally at both the program and course level. Teachers must adopt the program provided by the Ministère and build a “structured and well-founded frame of reference for competencies” (Perrenoud, 1998a, p. 17): “structured” in that the courses take shape according to logic of competency³ development; “well-founded” in that we must always be in a position to recreate the reasoning that leads us from the competencies to the courses. “To organize education based on competencies requires accountability from each educator, each discipline and each module; it means demanding that they reflect and make explicit their specific contribution to the development of competencies targeted as final goals” (Perrenoud, 1998a, p. 18). This means proceeding according to a logic based on the contribution of each discipline and specialty toward the development of competencies.

In all forms of education, this approach means that we must initially align ourselves with the program finalities to bring out the curricular knowledge, then identify what disciplines or specialties should be called on to contribute. We will then

establish the number of hours assigned to the disciplines and specialties based on the knowledge required for the development of the competencies. All this is complex and quite exacting for teachers, educational advisors and also for administrators. The consequence of this approach is aptly summarized by Raisky (1996, p. 44): “Education is no longer structured according to scientific rationale expressed through academic disciplines but according to professional finalities.” And he adds (1996, p. 50): “To succeed in the construction of a professional training program implies [...] that the nature of the knowledge in question is clearly identified so that it allows scientific knowledge and practices to be of service.

[...] the relationship to knowledge is the representation he has of his discipline, the understanding he has of the program of studies and its teaching content, and the connection he establishes between his discipline, the teaching content and the knowledge of his students.

This task, already a sensitive issue in the case of specialties (specific training), is all the more so in the case of contributing disciplines. The article by Sophie Maheu in this issue attests to this fact. The contributing discipline must align itself to the professional finality together with the commitment and cooperation of teachers of the specific program; it must then analyze and evaluate the required scientific knowledge without distorting or devaluating it. In a more global fashion, in pre-university training (within the framework of specific training) and in general education, this requires that each discipline align itself with program finalities, analyze and evaluate its contribution to the exit

² “Pedagogical content knowledge” refers to knowledge of contents relative to their teaching (Raymond, 1998, p. 3).

³ I use the term “competency” in the sense given to it by Tardif (October 28, 2005): “A complex knowledge to act supported by the effective mobilization and combination of a variety of internal and external resources within a family of situations.”



profile of the graduate. And here again, without distorting or devaluing it.

In each institution, if teams are working to rebuild competencies with a view to teaching them and are developing framework plans (local program of studies), this means that all teachers without exception must adopt and rebuild, for each of their courses, the structuring logic that was established locally. Additionally, each teacher works from the initial meaning he has given his discipline or profession, which, within the framework of courses that I taught, I refer to as the *essential attitude* of the teacher in his discipline or profession.

The concept of *essential attitude* in the discipline or the profession refers to the profound meaning of the discipline or profession, to which each teacher adheres; a meaning that he defends, pursues and towards which he leads the students implicitly or explicitly. As stated by Develay (1991, in Castincaud and Zakhartchouk, 2002, p. 22), disciplines “view reality in a specific manner”. It is this perspective that must be taken up and developed by the teacher himself, made explicit until he sees the meaning of what he is teaching and what is guiding him in the teaching of his subject matter.

From this perspective of searching for the *essential attitude* in technical training, pre-university training and general education, the fundamental question remains: What does it mean to practice respiratory therapy, physics, or literature? When it comes to a profession, it is necessary to bring out “the essential way of being and acting” of the professional; or, *vis-à-vis* a discipline, to ask ourselves how we construct knowledge in this discipline. In an article in this issue, Louis Normand provides a good example in physics. The example, here, deals with respiratory therapy teachers⁴.

The respiratory therapist is defined essentially as a person who:

- is centered on the patient,
- must act quickly to provide appropriate action in emergency situations (speed and effectiveness),
- and, even in unstable and varied situations, must react in a manner that respects the standards of his profession (professional ethics) (Lapierre, 2007).

Once the teacher is clear on the *essential attitude* of his discipline or profession, he is also clear about the MEANING he gives his subject matter, assuming, of course, he is teaching in his particular field. Teachers would benefit from clarifying the essential attitude that characterizes their discipline: On the one hand, it would allow them to update their fundamental orientations and their ultimate finality; in the longer term, it would undoubtedly encourage them to consult with each other relative to the meaning they should give their teaching within a common discipline or profession.

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▶ SECOND DIMENSION: THE STRUCTURING OF CONTENT RELATIVE TO FINALITES

Once the *essential attitude* or ultimate finality is clarified and integrated within the framework of the program competencies in which one teaches, a strategic question arises as regards the structuring of content relative to finalities. Establishing the relationship between content and finality is subject to didactic questioning and must be achieved through a process called didactization or the transformation of a reference situation into a learning situation.

Initially, I will present the components involved in didactic questioning; then, I will examine the sources and references more closely, the basic elements from which the teachers plan their courses and programs. On the one hand, I will clarify the sources and, on the other, I will introduce the references or representations of students as factors that teachers must take into account in organizing the content. I will then show that, on this basis, teachers realize a complex process of didactic implementation; it is what I referred to earlier as the didactization process.

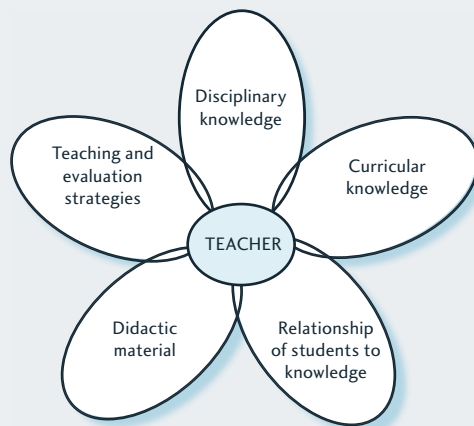
COMPONENTS INVOLVED IN DIDACTIC QUESTIONING: SOURCES AND RESOURCES

To visualize the components involved in didactic questioning, I've included a diagram developed by the task force, the flower of didactic questioning (figure 1).

⁴ Reflection of six teachers involved in a training activity on didactics during winter 2007.



Figure 1
THE FLOWER OF DIDACTIC QUESTIONING



Let us examine the diagram. The teacher is located at the heart of the flower, at the core of didactic questioning and implementation. Three of the petals, *disciplinary knowledge*, *curricular knowledge* and *relationships of students to the knowledge* symbolize the relationship the teacher maintains with his discipline and the program, on the one hand; and, on the other hand, the knowledge he has of the relationships that students have to the curricular knowledge or the subject matter under study. These three petals belong to the *sources* category, i.e. the basic components used by the teacher for course and program planning. The last two petals, *the didactic material* and *strategies*, are included in the *resources* category, in that they are the technical and strategic methods enabling the passage from planning to intervention; in other words, they represent potential actions.

The usefulness of this symbolic model is due to the fact that teachers have five possible access points in didactic questioning. There is no special order to access this questioning: Regardless of the “relationship to knowledge” category used as a starting point, all other relationships to knowledge can unfurl from this point. In such an approach, all access points are interrelated.

SOURCES 1: THE CHOICE OF CONTENT AND THE CHOICE OF REFERENCES

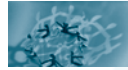
The distinction between sources and resources rests on the correlation between “what to teach” and “how to teach it”. In structuring the contents according to finalities, it is appropriate to stress “what to teach”, therefore both the curricular knowledge and the relationships of the students to the knowledge. This is easy to explain since college teachers play a determining role in the choice of teaching contents. However, precisely owing to the fact that teachers enjoy appreciable latitude relative to the choice of contents, this also involves a heavy responsibility relative to their sources or references. This is why the core concept of reference brings about the essential question: Where does curricular knowledge come from?

Generally speaking, curricular knowledge originates from knowledge and practices (Martinand, 1986; Perrrenoud, 1998b; Raisky, 1993), more precisely from scholarly knowledge, professional practices or situations and social practices.

First, **scholarly knowledge**. We can use the following definition: “Scholarly knowledge is knowledge that is accredited by the academic community and knowledge arising from current research” (Lapierre, 2007, p. 54). As an example: *The structure of proteins* is scholarly knowledge found in the content on *proteins* that contributes to the development of the competency *To interpret the connection between protein structures and functions* in the *Organic chemistry course of the Natural sciences* program.

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Then, **social practices**. The suggested definition corresponds to the following quotations: “Activities or interventions that take place within a given environment and which must be understood and situated” (Lapierre, 2007, p. 53). “[...] the practices refer to the actual activities of an identified social group that can be used as references for the design and analysis of school activities” (Reuter *et al.*, 2007, p. 181). It is therefore necessary to understand that this is a practical reference as opposed to a theoretical framework, that practice is part of an environment (social) and that this practice is used to build the teaching object or analyze it. In the article by Louis Normand, you will find an example of the construction of a teaching object taken from a social practice: the construction of a wind turbine.



Two consequences for teaching arise from the *social practice of reference*:

1. Scholarly knowledge is not the only legitimate knowledge that should be included in didacticization. Social practice can represent an autonomous starting point for didacticization (Martinand, 1986).
2. Social practice can be considered a “tool to reflect on teaching proposals relative to their social nature and significance” (Lebaume, 2001, p. 136).

It is important to always keep in mind that teachers didacticize the knowledge and not the practices per se. Because in the final analysis, the goal is to emphasize the knowledge involved in the practice.

Lastly, **professional situations**. In technical training, they represent the key reference. In practice, professional situations contain all the characteristic activities of the profession. Raisky defines the professional situation as a system composed of the following components or aspects: a context, finalities, values, issues, as well as practical, technical and scientific activities and knowledge⁵ (Raisky, 1993).

To analyze a professional situation, we must initially identify it and describe its context; then the finalities, the stakes and values within the professional situation can be clarified while carefully connecting what’s at stake to the finalities; finally, we will throw light on the practical, technical and scientific knowledge that professional actions imply (refer to the diagram by Raisky and Loncle, 1996, in the article by Nicole Bizier).

⁵ According to Raisky, knowledge, skills, and attitudes are part of each field or category: practical, technical and scientific.

Like social practices, professional situations can be an autonomous starting point for didacticization; in this case, the knowledge is to be identified and analyzed within the actual professional situations. Here is an example of scientific, technical and practical knowledge originating from a professional act within a professional situation.

- The profession: Respiratory therapy.
- The professional situation: To assist the anaesthesiologist in the operating theatre during the use of anaesthesia and ensure monitoring during a heart-lung transplant.
- An example of a professional act: After making sure the equipment is in place, the respiratory therapist checks to see he has the required medication and prepares the necessary dosages.
- *Scientific knowledge* relates to the various drug classifications, their effects and dosages; *technical knowledge* relates to the means of preparation and the quantities required; *practical knowledge* relates to the decision to prepare the medication after having set up the anaesthesia table and double-checked the apparatuses and monitors.

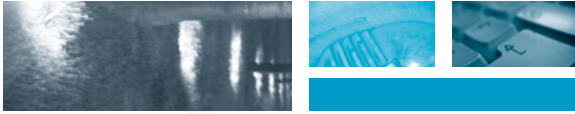
This example sheds light on the knowledge involved in a professional action carried out within a professional situation. It demonstrates succinctly that the professional situation can be an autonomous starting point for didacticization (Raisky, 1993).

SOURCES 2 – THE RELATIONSHIPS OF STUDENTS TO THE CONTENTS TAUGHT

If teachers align the content with the finality via the references, additionally they also plan this content by taking into account the “references” of the students, i.e. their knowledge. By this I mean the relationships students have with the content taught or the subject matter under study. Every student approaches a learning object based on the relationship he can establish with this learning object (Charlot, 1997, in Jonnaert and Vander Borght, 2003). Representations, concepts, preconceptions and knowledge are all terms used to describe “inherited knowledge” (Jonnaert, 2003, p. 308) that students possess, use and modify as they progressively take hold of a learning object. “The relationship between the course knowledge (or any learning object) and the knowledge of the learner is not direct, and cannot be considered systematic. It occurs through the learner’s *concepts* in connection with the learning object.” (Jonnaert, 2003, p. 309)

Let us keep in mind that teachers must deal with these *concepts* and use them in a way that allows students to grasp the learning object and to learn. In fact, these concepts or this knowledge of students can help or hinder learning. There are various means developed by science didacticians that allow for the expression and interpretation of these concepts. What remains then is to put strategies in place that enable students to move towards more workable concepts if they are using erroneous ones. After having done research with teachers over a period of several years, De Vecchi and Giordan affirm: “Actually, it seems necessary to focus on concepts that are ‘erroneous’ in order to transform them: it is necessary to ‘work with them to go against them’”. (De Vecchi and Giordan, 2002, p. 109)

More basically, as relates to sources, teachers and students must come to share the essential attitude that is to be developed in the profession or the discipline



concerned. I have called this essential attitude the ultimate finality and the fundamental reference. As Lapiere reminds us, (2007, p. 41): “This fundamental reference represents the worldview, the specific representation of reality from the perspective of the discipline or profession, a view or perspective integrated by the teacher himself, one he transmits implicitly or explicitly to his students. [...] The teacher has integrated this attitude, he is a model of it; for the student, and he is the essential mediator. He leads his students into this profession or discipline and the student gives meaning to what he is doing by grasping this attitude”.

THE DIDACTIZATION PROCESS: FROM REFERENCE SITUATION TO LEARNING SITUATION

The components of didactic questioning called sources have been presented. They are, on the one hand, references on the content and, on the other, the “references” or the knowledge of students relative to the contents taught. These components will now be used to present the process which goes from the sources to the classroom in a synthetical manner, i.e. from the reference situation to the learning situation.

Whether in technical training, pre-university training or general education, the process of didactization involves the concept of SITUATION (Raisky, 1999). He defines it as follows (1999, p. 39): “A situation is not a given but a construct occurring through an activity that mobilizes and produces knowledge.” A situation is the result of a contextualized activity, an activity in line with the finalities, in which the persons involved adopt, use and produce knowledge. The situation can be “adidactic” (reference situation) or didactic (learning situation). The notion of situation joins the notions of knowledge and activity. This situation-activity-knowledge system is central to the didactization process. “What is at stake in the didactic process, is not the mastery of fragmented ‘knowledge’ or ‘situations’ but the mastery of this situation-activity-knowledge system.” (Raisky, 1999, p. 39)

THE PROFESSIONAL SITUATION IN TECHNICAL TRAINING

In the section on sources, we outlined the elements used in the analysis of a professional situation according to Raisky’s model (1993). By using the finality of the training as a starting point, we can choose and analyze a typical professional situation, bring out the finalities, what’s at stake, the values, the professional actions and the knowledge, which enables us to make enlightened choices in the learning situation.

The regulating principle between the professional situation and the learning situation is isomorphism. “Professional knowledge, itself a model of professional practices and the knowledge at work in a didactic activity, must be organized along the same field lines; their internal logic, i.e. the question of values and finalities that will determine them, will be the same.” (Raisky, 1996, p. 54)

My experience with teachers in the field of technical training indicates that the problematics relating to values in the reference situation and in the learning situation are the same: The values at work in classroom activities are fundamentally the same as the professional values identified in the work environment. With regard to finalities in learning situations, the focus is more on mastering a process or an approach rather than on the result as seen in a professional situation.

The figure 2 is an example drawn from the analysis of a professional situation entitled *La gestion de la douleur d'une personne durant la période postopératoire dans une unité de soins de médecine-chirurgie* (Pain management for a person during the postoperative period in a surgical-medical care unit).

This work with teachers in technical training brings me to question the principle of isomorphism and to suggest that we speak instead of parallelism⁶ between the professional situation and the learning situation. This proposal has the advantage of bringing teachers back to their first responsibility, which is to choose the curricular knowledge based on the *essential attitude* (essential way of being and acting) of the profession to be developed by the students during their training period.

⁶ Consistent similarities between two or more objects being compared (Le Grand Robert, 2001).

⁷ With the consent of the Nursing teacher who handled this professional situation.

Figure 2

FINALITY ⁷	
PROFESSIONAL SITUATION	LEARNING SITUATION
To relieve the pain of the person under care	To relieve the pain of the person under care
To decrease the risk of complications <ul style="list-style-type: none"> • due to immobility caused by pain • due to complications linked to the administration of analgesics while awaiting treatment 	To justify proper care procedures subsequent to the symptoms observed



When all is said and done, in technical training the professional situation is the key reference and its analysis allows teachers to assume their responsibility as project manager of training that is aligned with the professional finality.

IN PRE-UNIVERSITY TRAINING AND GENERAL EDUCATION: THE COEXISTENCE OF SCHOLARLY KNOWLEDGE AND SOCIAL PRACTICES

Reference situations arising from social practices

In addition to scholarly knowledge, didacticization or the transformation into curricular knowledge in pre-university training and general education also comes from reference social practices (Martinand, 1986, 2001) that can serve as an autonomous starting point for didacticization. Lebaume (2001, p. 130) sums it up this way: "We can say that it (social practice) consists in connecting goals, contents and pedagogical activities to the situations, tasks and qualifications of an existing practice."

Remember the example of the construction of a wind turbine in physics (refer to the article by Louis Normand). From this perspective, the establishment of a wind turbine park represents an example of practice that can constitute at the same time a reference situation for disciplines like political science, economics, sociology, ecology and quite possibly other disciplines.

How can social practices constitute a relevant reference situation for teaching in pre-university training and general education? As each discipline possesses a specific perception of reality (Develay, 1991, in Castincaud and Zakhartchouk, 2002), the reference practice contextualizes the characteristic perception the

discipline has of reality; one can therefore make use of it as a reference situation or as a means of contextualizing a concept.

In summary, reference social practices can be used to build or analyze the teaching object or the learning object. One can work starting from the reference situation just as one can work starting from the teaching object. It is quite clear that the discipline will give meaning to the reference practice and that the knowledge involved in the learning situation will be improved and enriched by this meaning provided by the discipline.

Reference situation arising from scholarly knowledge

We commented earlier on the coexistence of social practices and scholarly knowledge as a reference situation in pre-university training and general education. The notion of scholarly knowledge can be associated to the concept of reference situation in the following manner: As experts of a discipline, teachers already have an understanding, a representation, a conceptual schematization of the scholarly knowledge that is to be taught.

The validity of the references, and by the same token, the validity of curricular knowledge raises the question of the legitimacy of contents as well as the relevancy of contents.

Let us take literary analysis in general education as an example. We could ask all those educated in literature who teach literary analysis to set out all the concepts contained in this scholarly knowledge, in other words to provide their expert conceptualizations: We would obtain diagrams or conceptual charts of experts. This is what is meant by reference situations. It is through their conceptualization that these educators didacticize literary analysis, i.e. actualize a learning situation. The article by Francine Authier in this issue features the path taken by a teacher coached by a resource person.

Allow us to reiterate that the reference situation like the learning situation highlights the situation-activity-knowledge trio and, in this, connects to the implementation of the concept of competency; this type of implementation, as we have seen, consists in using knowledge, skills and attitudes within a family of situations.

▶ THIRD DIMENSION: VALIDATING THE REFERENCES

The question of validating the references is transversal relative to the other two dimensions. Indeed, as soon as teachers work on finalities and content, they are led to check the validity of their sources or references. Given that college is part of post-secondary education, teachers make decisions regarding the choice of contents and references. These decisions come with a professional responsibility, that of validating their references and consequently the curricular knowledge.

The validity of the references, and by the same token, the validity of curricular knowledge raises the question of the legitimacy of contents as well as the relevancy of contents. To deal with the problem of legitimacy, it is essential to return to the sources or the authorities that guarantee the authenticity of the knowledge. The



problem of relevancy, i.e. the alignment of the content with the finalities, refers to the question: What purpose is served by what I teach? What is its meaning? What is its usefulness in the true sense of the word?

So, verifying the validity of references implies working on the appropriateness of the content as well as on the meaning that should be assigned to it relative to the development of the competencies in question.

CONCLUSION

The value of college teaching rests essentially on the ability of teachers to give meaning to the content. The meaning of what we teach and want students to understand is filtered through the content. This meaning comes primarily from the essential attitude of the discipline or the profession, an attitude borne by the teacher and the orientation of the content, given the finalities pursued and the sources chosen. When teachers are clear on the meaning to give content, they usually find the right strategies and are able to greatly influence the motivation of their students. ●

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