

Priscilla Eccles\*

## Faculty of Education and The Development of A Body of Knowledge of Teaching: A Response

This paper is a response to Dr. Evelina Orteza y Miranda's essay in the December, 1981 issue of JET,<sup>1</sup> in which she argues that knowledge of "how to teach" is too limited for the Faculty of Education to maintain credibility. The intention here is to examine the bases for this belief, as given by Dr. Orteza, and to offer a counterclaim that the argument is weak and not well supported in fact. To facilitate this, the general organization of the original will be followed.

Orteza begins by stating that the claims of the Faculty of Education as a professional school are credible only if supported by research findings. Let us accept this without question. Later, in conclusion, having devoted much effort to documenting her doubts that such a body of knowledge exists, a convenient safety net is provided: "It appears that Faculty, in its teachings on how to teach, fails to meet standards of truth, evidence for the claimed truth, and logic. It may be said that this is an exaggerated charge. Still, it cannot be dismissed as completely false."<sup>2</sup>

Of course, one must agree with this as well. The charge is not "completely false." There surely is no profession so complacent as to claim it has a fully validated, comprehensive body of knowledge which is expected to be true for all time and is free of contradiction and ambiguity, without controversy over substantive issues, and with all terms clearly defined. But throughout the body of the paper, the argument is in support of the stronger accusation of "failure to meet standards of truth," so the reader is asked to examine the evidence for this claim.

Our attention is now called to a book entitled "Teaching in the Universities"<sup>3</sup> which is described as "having only two out of twenty three contributors . . . formally connected with Faculty"<sup>4</sup> (Faculties of Education). Judging by the quotations offered, this book consists of rather charming personal testimonies from amateur, although perhaps gifted, teachers.

It is difficult to perceive the relevance of the above. Apparently showing a group of university professors to be ignorant of — or to be ignoring — a body of knowledge is being offered as evidence that the body of knowledge does not exist.

At this point Dr. Orteza turns to the professional education literature to document her concerns.

The first quotation (reference number 15 in her paper)<sup>5</sup> says, "40 years of research on teacher effectiveness has not yielded knowledge which can be used in planning teacher education programs." Please note the date of this reference. It was said, and was largely true, in 1953.

---

\*Department of Teacher Education and Supervision, Faculty of Education, University of Calgary.

She continues with "Current research . . . reached the same melancholy conclusion" and again illustrates with an appropriate quotation. (footnote number 16)<sup>6</sup> The ultimate source for this quotation is the 3rd edition of the Encyclopaedia of Educational Research, published in 1960.

Contrast the following, taken from the 4th edition of the Encyclopaedia published in 1969.<sup>7</sup> The fifth edition will be published sometime this year but is not yet available.

The research which is reviewed herein permits cautious optimism and indicates that the tools long needed for the analysis of the teaching-learning process are gradually being developed. This optimism is in contrast with the conclusions reached in past reviews.

Surely there are very few active fields of inquiry in which a summary written twenty-two years ago would be considered "current." And, even if one wishes to regard it as "current," there is a scholarly obligation to use the latest edition of a reference or at least to acknowledge its existence.

The next reference (17 in the original paper),<sup>8</sup> which presumably explains this "dismal failure," was written in 1945.

Reference 19, which continues to elaborate the problems of teacher evaluation, was written in 1961.<sup>9</sup>

### *A Digression?*

The next few paragraphs in the original present a problem in interpretation:<sup>10</sup>

To say that there are different kinds of teacher effectiveness for different kinds of programmes, for different kinds of subject matter, of learners, may be correct. But it does not follow that it is impossible to develop a common standard for judging any and all activities. To say 'each teacher can only be judged, therefore has to be judged in his own way' is odd.

Yes, of course it's odd. But who has said it? The single quotes in the line above are not a stylistic error, so it was in the original, and the remark is not attributed. The last part which could possibly derive from the preceding reference, (i.e. the Hunka and Anderson paper<sup>11</sup>) ends with the word "correct" in the passage above and the next footnote in the original (number 20)<sup>12</sup> supports quite a different point.

One paragraph further on, "'each teacher has to be judged in his own way' . . . cannot be taken seriously." Of course not, but who has said this? And, "Also there is something odd in saying, 'in the person of the teacher will be discovered knowledge of/about teaching'." Odd, indeed, but who said it? (The single quotes here, again, are in the original and, again, no source is given.)

One begins to wonder if the single quote is being used to indicate a "sort-of" quote. The kind of thing that might be said by a straw person. There is no harm in this kind of mock debate except that, in the context of this paper and with three paragraphs devoted to refuting these remarks, the reader might assume that these rather silly ideas are widely held views in Faculties of Education, that they are representative of the professional content which we teach.

### *Is there knowledge of how to teach in 1982?*

Returning to the material where sources are identified, the only references from the professional literature which could, by even the most generous standards, be considered recent are from a book published in 1970 and two articles that appeared in *Teacher Education*, one in 1972 and the other in 1974.

The 1974 article by George Pederson is, in the original, cited in footnotes 20 and 22<sup>13</sup> although the series of quotations are written to appear as if we have three authorities instead of only two.

The state of our knowledge of/about teaching and learning, says an authority of teacher education, ". . . is that many relationships (between them) remain ill-defined or at best unresolved . . . To assume otherwise

and develop performance based criteria predicated on a variety of inadequate assumptions is less than defensible."<sup>20</sup> The problem is ". . . there is no widely accepted formulation of what the (necessary) components of teaching are, and without such a formulation it is not possible to identify the core activities of (it) . . ."<sup>21</sup> In a more sweeping judgment, a teacher educator concludes: Teacher education is in a ". . . blissful state of ignorance and irrationality."<sup>22</sup>

Pederson wrote a position paper intended to persuade and overstated his case as such papers frequently do. He did not review the literature but seems to have relied largely on Peck and Tucker's chapter, "Research on Teacher Education" in the Second Handbook of Research on Teaching published in 1973.<sup>14</sup> In fact, Orteza's final quotation from Pederson is a paraphrase of one of their concluding paragraphs. Peck and Tucker: "Teacher education can no longer remain in a happily ignorant ineffectual state . . ." Pederson: "Teacher education simply cannot be allowed to remain in its present blissful state of ignorance and irrationality." But Peck and Tucker proceed immediately, in the very same paragraph to say:<sup>15</sup>

We are genuinely in sight of the theoretical principles, the operational measures and even the developmental technology for moving into a performance-based method of appraising teaching.

And the overall tone of their chapter is positive. A number of studies were cited and taken seriously as verified knowledge.

The University of Calgary library did not have a copy of the Dreeben book. (references 21, 17, 29, 35).<sup>16</sup> However, a later work, his chapter, "The School as Workplace" in the Second Handbook<sup>17</sup> indicates that he continued to take a dim view, as in ". . . highly debatable assumption that there are valid criteria for judging the quality of teaching." But in that chapter he also gave positive and extensive attention to "The recent work of Kounin on discipline and management of classrooms . . . perhaps the single most important contribution to our understanding of the peculiarities of authority relations in classroom settings." Since that time, this research has been adapted for and is widely used in teacher education.<sup>18</sup>

The book referenced in footnote 24 is Dwight Allan and Kevin Ryan's, *Microteaching*,<sup>19</sup> published in 1969, and the quotation chosen was, in context, stating a problem which the authors were confident microteaching would solve. Given the expectations of microteaching it would be contradictory for them to believe that a body of knowledge about "how to teach" did not exist. And they do, in fact, attribute teacher uncertainty about how to teach to poor training methodologies rather than lack of knowledge in the profession.

The distinction between lacking a body of content and failure to teach that content effectively is an important one. Traditional university teaching methods have not been very effective in teacher education and many of us are seriously concerned about the teacher education program, but this is a different issue.

We have now looked at almost the entirety of Dr. Orteza's documentation for the claim that there is no body of scientific/empirical knowledge of "how to teach." It would seem reasonable to expect a charge as serious as this to be documented with material that is current, with some effort toward a comprehensive survey, and, if a reviewer wishes to comment on the extent to which the knowledge claims exemplify verified knowledge, he or she should read at least some of the representative studies rather than relying on borrowed opinion. The supporting evidence offered in Dr. Orteza's paper just does not meet these criteria.

But perhaps the field is fallow? Perhaps nothing has been added to the body of knowledge since these opinions were expressed? Not true.

As early as 1974, Dunkin and Biddle<sup>20</sup> reviewed about 500 studies of teaching. This work, highly valuable in its day, is outmoded both in substance and in the method of reviewing and comparing

findings, but it is more recent than any of Orteza's sources and gives us a comprehensive picture to that point. They summarized their work in a sixty-one page chapter on "Findings for Teachers". The concluding statement of that chapter reads:

We began this text by encouraging readers to believe that research on the processes of teaching was a vital necessity and that this research has already generated findings useful to educators. This chapter has summarized evidence for those claims. Most of the evidence so far advanced is suggestive rather than definitive. Some of it concerns notions for the improvement of teaching that don't appear to work; some of it presents evidence for ideas that do. Some of the conclusions reached are tentative because studies of crucial relationships have not yet been conducted, because of limited samples, or because evidence from field surveys has not yet been confirmed with experiments. Little has yet appeared by way of theoretical integration for this field, although the outline of theories can be discerned. But scores of variables for describing classroom events are now available from this research for which literally hundreds of suggestive findings have been developed! At long last we are beginning to know what is actually going on in the classroom, as well as what produces end results from classroom events. Surely the appearance of this research effort is one of the most significant developments in education during the twentieth century.

Medley, writing in 1979<sup>21</sup> applied strict criteria in reviewing 289 studies. Retaining only those in which effectiveness was measured in terms of student gain over several months, which used systematic observation schedules, gave evidence that results were generalizable to a different sample of teachers, and which identified important relationships (defined as equivalent to a correlation coefficient of  $\pm .387$ ) he was left with only fourteen. But, in those fourteen, he found "600 important and dependable relationships . . . many of these relationships were verified in more than one of the studies."

A recent book, which speaks directly to many of the points raised in Orteza's paper, is based on the Sach Memorial Lectures given by N.L. Gage at Columbia Teachers College in 1977.<sup>22</sup>

I am now entering into matters on which most writer's conclusions over the years have been negative; mine and some others (e.g. Good, Biddle, and Brophy, 1975; Rosenshine, 1976) are positive. Most reviewers have concluded their reports by saying that past work has been essentially fruitless. Such discouraging characterizations of previous findings go back at least 25 years (see for example, Committee on the Criteria of Teacher Effectiveness, 1952) and are still being repeated in present-day publications.

For example, in 1978 Doyle asserted that "Reviewers have concluded with remarkable regularity, that few consistent relationships between teacher variables and effectiveness criteria can be established" (nine reviews cited p. 164). Similarly Shavelson and Dempsey (1976) began by noting that the research has not "identified consistent, replicable features of human teaching that lead directly — or even indirectly — to valued student outcomes" (p. 553). These conclusions may be questioned — and have been questioned recently — on many grounds.

And Gage goes on to elaborate the reasons for his more optimistic view. In fairness to Dr. Orteza, it must be said that, had she been more familiar with the literature, more recent and more authoritative support for her position could have been identified. But, in this writer's opinion, Gage's optimism is even more justified today than it was five years ago. Up to that time much of the research had been done by individuals with meager financial resources. As a result the number of teachers studied was in each such study very small. In the tradition of quantitative research, results were analyzed statistically which for technical reasons gave a high risk of Type II error. (Accepting the null hypothesis when there is, in fact, a treatment effect). Gage notes this problem but at the time he was writing the re-analysis of this information using techniques of meta-analysis had just begun. Papers continue to be published which use this technique to verify relationships which these early studies could not identify satisfactorily.

For this and other reasons there has also been a move away from individual research efforts to large scale studies under contract to state or federal departments and to establish permanent research institutes such as the Institute for Research in Teaching located at Michigan State University. This institute, in the period since Gage gave these lectures, has published 108 monographs in its research

series, has fourteen on-going projects in the fall of 1981, and has just entered into a new three year, \$4.2 million contract with the National Institute for Education.

This is only one example of the current healthy state of research into the teaching process. In summary, the research effort and substantive findings coming out of the scientific/empirical tradition seems much more impressive than was the case when the authors cited by Dr. Orteza were reviewing the state of knowledge.

*Is knowledge of subject matter sufficient knowledge of "how to teach"?*

In another section of her paper<sup>23</sup> Dr. Orteza raises a perennial question, "If knowing what is taught dictates how it is taught, may it not be argued that authorities in the subject matter fields are equally capable, or some may say, more capable of teaching methods courses in the subject areas than members of Faculty?"

Surely knowledge of subject matter can be considered a necessary condition for deriving and teaching an effective methodology without the need to think of it as a sufficient condition. The question is whether there is something more than knowledge of subject matter in knowing "how to teach."

This paper has respected Dr. Orteza's interest in discussing teaching at the generic level although this excludes a substantial body of knowledge that is "subject specific," i.e., how to teach science, math, French, etc., (See Gage<sup>24</sup> for a discussion of this problem). There is another reason for excluding the "subject specific," few individuals have a comfortable command of more than a small part of this material. But when, by happy coincidence, she goes on to ask, "May a member of Faculty, say one concentrating in teaching of biology be bold enough to teach a biology professor how to teach his course in biology, claiming he has knowledge of how to teach which the biology professor does not possess?" it becomes possible for me to give a very personal answer.

I have an MSc in the Teaching of Biological Sciences and an EdD in Science Education with a minor in Biology — and would I be bold enough to teach a biology professor how to teach — yes I think I might. As with any experienced teacher, I would prefer to act as a consultant rather than in the formal pupil-teacher relationship. And I would not want to claim that all biology professors would benefit from my attentions. If a professor has a group of motivated, intellectually mature, intelligent students (which we would all like university students to be) then very little technical skill in teaching is necessary. The professor serves as a model of scholarship and if, in addition, he has normal powers of communication, a clear idea of what the student should learn, and the common sense to have his examinations reflect those intentions, he may be quite justified in feeling satisfied with his work.

But, assuming now we have a biology professor who has cause for concern, a genuine feeling that he could do better, what can someone like myself offer?

It may be that he is just making some bad assumptions about where his students are in terms of intellectual maturity. I could identify some diagnostic tests and models for constructing such tests which might be of benefit.<sup>25</sup>

If an instructor wished to modify the way in which content is presented for learning, Novak's book "*A Theory of Education*"<sup>26</sup> (really a theory of science instruction), which is largely based on Ausubel's theory of meaningful verbal learning, would be a good guide. Also in 1981, the Association for Education of Teachers of Science brought out a yearbook in which leading scholars in cognitive psychology considered the meaning of their work for the teaching of science and, in a number of instances, elaborated teaching procedures which should be effective; as, for example,

Lawson and Lawson's, "A Theory of Teaching for Conceptual Understanding, Rational Thought, and Creativity."<sup>27</sup>

The university teacher of science does a lot of explaining, sometimes not very effectively. Often this is a matter of attempting to explain a phenomenon using a generalization which the students do not know or do not understand. The explanation is scientifically and logically sound but fails to meet psychological criteria for explanation. Or the expert may, in relating the generalization to the particular, assume connections to be immediately apparent when, to meet students needs, it is necessary to explicate in detail. An objective observer, particularly one less expert in the subject matter, may be quite helpful in identifying the difficulty. In effect one can, in this and other subject related matters, take what is vaguely perceived by students as "not clear" and define the problem in a way that facilitates solution. A definite aid to solving this kind of problem is Ennis's *Logic in Teaching*<sup>28</sup>, which might be thought of as a general methods text for those dealing with academic subjects.

If discussion is an important part of the course, then skill in asking higher order questions is essential. Again, one gains skill in these matters through guided practice and that guidance is best done by someone whose ear is tuned to the relevant content in classroom discourse.

Few biology professors would wish to limit course objectives to memory of specifics, but tests and exams sometimes indicate otherwise. Most university professors would profit, and probably enjoy, a course in tests and measurements.

Proper use of the laboratory is crucial in science and frequently a disaster area. Failure to discriminate between laboratory activities which function as exemplars of concepts, principles, and processes in the expository mode and the function of the laboratory in the inquiry mode results in laboratory exercises that systematically teach students to lie about or invent what they think is data. Since biology professors must surely be as sensitive to the evil of this as a science educator, it is only reasonable to conclude that it results from poor technique rather intention; and technique can be learned.

*What do we mean by "teaching"?*

It is possible that, for definitional reasons, Dr. Orteza would not consider any of the above suggestions to be truly teaching. The traditional teacher-pupil (superordinate-subordinate) relationship seems to be implicit in her concept of what teaching is and this is, probably, why the prospect of offering to teach a colleague seemed such a shocking instance of academic bad manners.

Indeed much of the difficulty which may be found with the rest of her paper probably originates with the definitional problem. At this point it is necessary to skip over to page 181<sup>29</sup> in the original paper. It is there that Dr. Orteza, arguing the need for clarification of terms, gives us a definition of teaching which, one supposes, she has been using throughout. The task of the faculty (in understanding "how to teach") is seen to be, in part a conceptual task, one that seeks "for a correct concept of teaching . . . For now, definitions about teaching are either stipulations, private points of view, or slogans."

The present writer does not know what a "correct" concept is and, therefore, if it can be disputed. But the concluding sentence above opens the possibility of considering the definition which occupies the ellipsis to be one stipulated by Dr. Orteza and, therefore, one whose usefulness is open to question.

It may be shown that the following conditions must be present whenever one speaks of "teaching"; (1) an intention to bring about learning on the part of the learner; (2) an intention to bring about learning in a rational manner on the part of the learner that something is true; (3) an intention to bring about learning in a rational

manner on the part of the learner that something is true and which intention the learner recognizes. When anyone of these conditions is violated, the term "teaching" is rendered slightly odd!

Most members of faculties of education when speaking of "how to teach" mean how to carry out the instructional role of the teacher. This seems very close to Komisar's<sup>30</sup> "teaching enterprise" which in turn seems to be what B.O. Smith<sup>31</sup> had in mind when he defined teaching as "a system of actions intended to induce learning."

Orteza seems to be closer to Komisar's "intellectual act of teaching".<sup>32</sup> It will be argued here that while this intellectual act of teaching may refer to almost the entirety of what university professors do, it is only a small part, and not the most important act, that elementary and secondary teachers carry out.

Even viewing the definition as only part of what teaching means in the phrase "how to teach", it is not clear if the restrictions added by Orteza are necessary conditions.

Bringing about learning in a non-rational way doesn't sound nearly as odd as it would have before the current flurry of interest in right brain-left brain research.<sup>33</sup> What does rational mean when one is teaching science to pre-operational or concrete operational children since knowledge claims of science are based on a mature reasoning pattern which is difficult, if not impossible, for them? What is rational, and in what sense can one explain or justify, when teaching spelling to 4th graders? Is teaching the skill subjects to young children really all that different from indoctrination?

"Clarifying the meaning of 'teaching' enables one to say whether or not the activities going on are central and necessary to teaching, peripheral, or simply associated with it."<sup>34</sup> There are some very important differences between what university professors do and what school teachers do, between what is central and peripheral in each case. A definition that does not cover both cases may simply confuse our thinking.

For example, the enormous cognitive dissonance that the following paragraph creates for this writer probably arises from this definitional problem.

Now, if student teachers are practising practices of classroom management when they engage in practice teaching, this indicates that classroom management is a practice of teaching. To teach is to manage a class or to control its behavior in order that learning on the part of the learner is facilitated. . . . But this is not good enough. It raises the question, "is classroom management teaching?" Classroom management . . . is not necessarily teaching. It consists of preparatory activities intended to facilitate the achievement of the teaching-learning ends . . . activities preparatory to practices of teaching are not, however, identical to practices of teaching. They are related in that the former is a pre-condition of the latter but the relationship that holds between them is not a logical one . . . To admit that one has learned to manage a class is not to admit that one has learned how to teach and learned to teach whatever he is supposed to teach . . . the crucial question for teaching is "what to do once the room has grown quiet and all eyes are on the teacher"<sup>35</sup>

In contrast to this view of what teaching is (ought?) to be, Barak Rosenshine<sup>36</sup> describes the contemporary elementary classroom as a place where "discussion and verbal explanation by the teacher is relatively low . . . Today students spend from 50 to 70 percent of their time working alone and only 20 to 15 percent of their time in teacher-led discussion." He notes that classroom research related to the teaching of basic skills has shifted to a concern for variables such as time on task, the settings that promote pupil engagement, and the academic content covered. These are management variables. A definition of teaching that excludes 80 to 85 percent of what an elementary teacher does will hardly be helpful in studying "how to teach."

And, continuing to the next, equally puzzling, paragraph:<sup>37</sup>

Classroom management may be considered as a pre-condition of/to teaching. It consists of practical considerations. For examples, such matters as (1) personal characteristics . . . characteristic gestures, posture, modes of action, speech patterns, grooming . . . which may either facilitate or hinder teaching and

learning. (2) communication skills . . . ability to verbalize . . . to draw upon a store of knowledge . . . to illustrate points. (3) Interaction skills . . . patterns of initiation and response . . . length and character of interaction sequences (4) strategy and tactics of maintaining order. All these can be taught and learned effectively on the job, considering that they arise out of practical settings of actual classroom teaching situations. As practical considerations requiring application to specific situations they are not challenging epistemologically.

The strange bedfellows of this list surely present a conceptual problem for most teacher educators, as does the designation of personal qualities, communication skills, and interaction skills as "classroom management." It only makes some sense if Dr. Orteza is systematically excluding, by definition, any teaching activity that could be considered "merely" a skill. A more balanced position is expressed in the introduction to *Logic in Teaching* which was referred to earlier<sup>38</sup>:

This book is concerned with rigor of instruction and learning at all levels and in all subject-matter areas where rigor is possible. Its treatment of definition, explanation, and justification ultimately reduces to a treatment of the broad logical aspect of how to talk and think in the classroom. Although psychological aspects, such as motivating and controlling students, are extremely important and should temper the application of principles of logical teaching, they are not the subject matter of this book. Please be absolutely clear that although I do not continuously say so, I believe that logical teaching can only be effective if the proper psychological moves are made also. All the rigor you can muster is of no value if no one is paying attention.

Orteza's definition seems to be very much influenced by the university teaching role, the one with which she is familiar and which she practices. Idealizing the professor, the educational requirements for the job, the emphasis placed on scholarly activity, and the common use of the lecture as a medium for presenting and processing information, assume that he speaks as an authority in his field, as a critical and informed scholar in the discipline. This knowledge and the appropriate communication of it is truly central to his "teaching." With a few exceptions, this kind of authoritative knowledge is not central to the work of the school teacher. In even the most traditional of secondary classrooms the textbook is the source of authoritative knowledge and the dominant method is the recitation (which is designed to force somewhat reluctant and far too numerous pupils to "cover the material"). More-up-to date teachers use a far wider range of instructional materials and techniques which include having pupils learn directly by carrying out modified versions of the methods of inquiry used in the discipline. It is the learning tasks defined by these materials and methods on which "all eyes are to focus". Professional knowledge deals largely with the high level skills necessary to keep this process going. In teaching school the intellectual content is not directly professed. The intellectual act of communicating knowledge is not central to the teaching enterprise. A definition of teaching that causes us to overlook or discount the importance of any part of these professional skills will not be helpful or appropriate in teaching people "how to teach." Picking apart a coherent teaching act into incoherent bits so that one may be labeled "truly teaching" and another "managerial" will not help to understand what teachers do or assist in teaching others how to do it.

All teacher education has a practicum component in which the prospective teacher identifies teaching problems, makes pedagogical decisions, and practices relevant skills. The theoretical content of teacher education, including knowledge of subject matter, provides a conceptual structure which the teacher uses in this real situation. This knowledge influenced how the teacher teaches in the real classroom and, in turn, is influenced by that student teaching experience.<sup>39</sup> This is quite a different matter than learning on the job in an atheoretical frame of reference.

It seems a reasonable conclusion that Orteza and the present writer not only fail to use a common definition of teaching but perhaps also lack a common definition of definition, of the meaning of classroom management and, probably, a common view of how theory and practice relate.

Further discussion of these points would not seem to be productive. And there is no graceful way to exit a morass other than an abrupt jump to different ground.

### *Are there other sources of knowledge of "how to teach"?*

So let us look at two examples of knowledge of "how to teach" that include logical/analytic knowledge as well as scientific/empirical.

Some of the best teacher education material at the generic level is found in the five volume *Micro Skills Handbook Series* published by the University of Sydney. For example, with regard to the skill of explaining,<sup>40</sup> classroom examples and training exercises are preceded by 43 pages of theoretical content, including discussion of different kinds of explanation, the function of explanations in making psychological sense, and the findings of classroom research as these relate to variables such as clarity. There are several volumes in this series, each covering a number of skills. The volume referenced here also deals in a comprehensive way with the skill of introductory procedures and closure and with advanced questioning.

A very respectable teacher education program could be constructed from this series alone and there is a substantial amount of similar material available. It isn't commonly used, not because the knowledge base is tentative and subject to change and modification, although this is, of course, true, but because most teacher education in methodology emphasizes, and Faculties of Education are organized to teach, subject-specific content. The reader should remember that the decision to restrict this discussion to the generic level was made in the original paper. Most faculty members are not convinced that this is the most useful body of knowledge for the beginning teacher.

Joyce and Weil<sup>41</sup> have codified twenty-two teaching models, each of which identifies the goals for which it would be an appropriate strategy. The teacher role and the pupil role is defined, the appropriate classroom social structure is described and, finally, they outline the syntax, or sequence of teaching acts, which make up the model. Some of the models are based on psychological theory (Bruner, Ausubel). Some are developed by analogy to counseling or personal development techniques (non-directive, synectics). Others are based on an examination of the requirements of the content disciplines (biological inquiry, jurisprudential). These models can be modified and other models can be developed to the same specifications. Joyce and Weil define a professional teacher as a person who has a repertoire (and the appropriate skills) of several models. Training materials for these models are also available and experienced teachers studying at the graduate level find this material useful but, again, pre-service teachers seem better served by a more subject-specific approach.

#### *In conclusion*

In her summary<sup>42</sup> Dr. Orteza outlines the tasks involved in developing a systematic body of knowledge. The conceptual task is seen as a search for a correct concept of teaching. The usefulness, and even the necessity, of examining our concepts and explicitly stating the definitions we are using has been illustrated in this paper. But is it useful to arrive at highly restrictive definitions that are contrary to common usage in the profession and that, in effect, close one's mind to changing roles and technological inventions as legitimate exemplars of the concept?

The second task is the empirical task. This paper has tried to show that the extent and the epistemological status of empirical knowledge of teaching and its effect on learning is much more substantial than Dr. Orteza realizes.

The third task described is the "judgement task . . . justifications supporting certain judgements made on empirical truths of "how to teach."

Implicit in her descriptions of tasks two and three is the view, shared by many, that a scientific/empirical body of knowledge would, providing one wished to use it, prescribe good teaching

practice. But there is a different view of the relationship between theoretical and practical knowledge of teaching. The following summary of Joseph Schwab's position states the case.<sup>44</sup>

The theoretic (the word is used as a noun) labels a kind of human activity in which the end sought is warranted knowledge. Researching and theorizing are activities within this realm. The knowledge sought is necessarily general. In theorizing, one abstracts certain particularities of the concrete instances under study, but of necessity ignores others. Hence competing theories can coexist, each offering a different (but equally respectable) explanation for the same generic phenomenon, for example, learning, personality development, the nature of science.

The practical (again the word is used as a noun) labels a different kind of human activity, one in which the end sought is defensible decision. Mr. Smith trying to decide what to do when Johnny Jones does not understand the Krebs Cycle is an example of an activity in this realm. The decision sought is necessarily very highly specific and concrete. It is unique. In making the decision a teacher must consider the contextual particularities of the situation. Also, competing "possible-decisions" of equal respectability cannot coexist because the teacher must make some specific action . . .

Theory and practice in science education are complementary but it should be abundantly clear . . . that a researcher's theorizing cannot be substituted for (or directly put into) a teacher's deciding, and vice-versa.

Dr. Orteza has said that she does not find practical knowledge epistemologically interesting. But if knowledge of how to teach *is* practical knowledge then studies of how teachers think about their work, what information they look for and consider, how they process this information and how they judge the effectiveness of their decisions may be what we need to know and the key to better teacher education. Clearly proper justification of teaching acts (the third task) would be quite different depending on which of these positions one were to take. This paper is not attempting to resolve this issue it is only pointing out that there is more than one way to think about the problem.

The body of knowledge on which faculties of education can draw originates in many universities and in many countries. Canadian universities have not and probably will not make much contribution to quantitative scientific studies in classroom teaching because they lack the funding necessary to meet current standards in this field. But there are other research paradigms through which our understanding of the teaching process can develop<sup>44</sup> and, to end on a note of strong agreement, there is no more appropriate goal to which the scholarly efforts of this and other faculties could be directed.

#### Notes

<sup>1</sup> Evelina Orteza y Miranda, "Faculty of Education and the Development of a Body of Knowledge of Teaching," *The Journal of Educational Thought*, Vol. 15, No. 3 (December 1981), pp. 171-186.

<sup>2</sup> Orteza, p. 181.

<sup>3</sup> The reference (footnote 3 in the original) is to Edward F. Sheffield, ed., *Teaching in the Universities*. (McGill-Queen's University Press), 1974.

<sup>4</sup> A peculiarity of the original is that "Faculty" is said to refer to "Faculty of Education" in the singular when, clearly, in context, the author frequently means Faculties of Education in the general sense.

<sup>5</sup> Orteza: A.S. Barr et al. "Second Report on the Committee on Criteria of Teacher Effectiveness," *Journal of Educational Research*, Vol. 46 (1953), p. 657 Quoted in C.C. Andersen and S.M. Hunka, "Teacher Evaluation: Some Problems and a Proposal", *Harvard Educational Review* Vol. 33, No. 1 (Winter, 1963), p. 2.

<sup>6</sup> Orteza: Harold Mitzel in *Encyclopedia of Educational Research* (3rd edition), New York: MacMillan, 1960, p. 1481. quoted in James T. Sanders. "Good teaching — A Disjunctive Concept?" *Teacher Education* (Spring, 1972), p. 14.

<sup>7</sup> Ned A. Flanders and Anita Simon, "Teacher Effectiveness," in *Encyclopedia of Educational Research* (4th edition) (New York: MacMillan, 1960), pp. 1423-1437.

- <sup>8</sup> Orteza footnote 17: A.S. Barr et al., *The Measurement of Teaching Ability*. (Madison, Wisconsin: Dembar Publications, 1945.) Quoted in C.C. Anderson and S.M. Hunka, p. 2.
- <sup>9</sup> Orteza footnote 19: A.S. Barr et al "Wisconsin Studies of the Measurement and Prediction of Teacher Effectiveness," *Journal of Experimental Education* Vol. 30 (1961), pp. 150-151. Quoted in C.C. Anderson and S.M. Hunka, p. 2.
- <sup>10</sup> Orteza, page 175.
- <sup>11</sup> Anderson and Hunka, "Teacher Evaluation: Some Problems and a Proposal."
- <sup>12</sup> Orteza footnote 20: K. George Pedersen, "The Case for Reform in Teacher Education," *Teacher Education* (Spring, 1974).
- <sup>13</sup> Pedersen, pp. 9 and 15. Footnote 22 in the original repeats the reference to page 15.
- <sup>14</sup> Robert F. Peck and James A. Tucker, "Research on Teacher Education," in Robert N.W. Travers, (ed.) *Second Handbook of Research on Teaching* (Chicago: Rand McNally, 1973), pp. 940-978.
- <sup>15</sup> Peck and Tucker, page 971.
- <sup>16</sup> Robert Dreeben, *The Nature of Teaching* (Glenview, Illinois: Scott Foresman and Co., 1970), p. 151.
- <sup>17</sup> Robert Dreeben, "The School as a Workplace," in Robert N.W. Travers, (ed.), *Second Handbook of Research on Teaching* (Chicago: Rand McNally, 1973), pp. 450-473.
- <sup>18</sup> Jacob S. Kounin, *Discipline and Group Management in Classrooms*. (New York: Holt, Rinehart and Winston, Inc., 1970).
- <sup>19</sup> Orteza footnote 24: Dwight Allen and Kevin Ryan, *Microteaching* (Reading, Mass.: Addison Wesley Publishing Co., Inc., 1969), p. 61.
- <sup>20</sup> Michael J. Dunkin and Bruce J. Biddle, *The Study of Teaching* (New York: Holt, Rinehart and Winston, Inc., 1974), pp. 357-418.
- <sup>21</sup> Donald M. Medley, "The Effectiveness of Teachers," *Research on Teaching*, ed. Penelope L. Peterson and Herbert J. Walberg (Berkeley, California: McCutchan Publishing Corporation, 1979), pp. 11-27.
- <sup>22</sup> N.L. Gage, *The Scientific Basis of the Art of Teaching*, (New York: Teachers College Press, 1978), p. 24. The works to which he refers are: (a) Good, T.L.; Biddle, B.J.; and Brophy, J.E. *Teachers make a difference* New York: Holt, Rinehart and Winston, 1975; (b) Rosenshine, Barak. *Teaching Behaviors and Students Achievement*, London: National Foundation for Educational Research in England and Wales, 1971; (c) Doyle, W. "Paradigms for Research on Teacher Effectiveness," In L.S. Shulman (Ed.) *Review of Research in Education* (Vol. 5). Itasca, Ill.: F.E. Peacock, 1978 (69-74); and (d) Shavelson, R. and Dempsey, N. "Generalizability of Measures of Teaching Behavior," *Review of Educational Research*, 1976, 46, 553-611.
- <sup>23</sup> Orteza, page 180.
- <sup>24</sup> N.L. Gage, "The Generality of Dimensions of Teaching," *Research on Teaching*, ed. Penelope L. Peterson and Herbert J. Walberg (Berkeley, California: McCutchan Publishing Corporation, 1979), pp. 264-288.
- <sup>25</sup> Robert Karplus. "Opportunities for Concrete and Formal Thinking on Science Tasks," (Berkeley: University of California. Lawrence Hall of Science, 1973). ERIC Document Ed 132053.
- A.L. Lawson, "The Development and Validation of a Classroom test of Formal Reasoning," *Journal of Research in Science Teaching*, Vol. 15, no. 1, 1978. pp. 11-24.
- <sup>26</sup> Joseph D. Novak, *A Theory of Education* (Ithaca, New York: Cornell University Press, 1977).
- <sup>27</sup> Anton E. Lawson and Chester A. Lawson, "A Theory of Teaching for Conceptual Understanding, Rational Thought, and Creativity," *1980 Yearbook of the Association for the Education of Teachers in Science* (Ohio State University; ERIC Clearinghouse for Science, Mathematics and Environmental Education, 1979), pp. 104-149.
- <sup>28</sup> Robert H. Ennis, *Logic in Teaching*. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1969).
- <sup>29</sup> Orteza, p. 181.

<sup>30</sup> B. Paul Komisar, "Teaching: Act and Enterprise," *Concepts of Teaching*, ed. C.J.B. MacMillan and Thomas W. Nelson (Chicago: Rand McNally and Company, 1968), pp. 63-88.

<sup>31</sup> B.O. Smith, "A Concept of Teaching," *Language and Concepts in Education* ed. B.O. Smith and Robert H. Ennis (Chicago: Rand McNally and Company, 1961), pp. 86-101.

<sup>32</sup> Komisar, p. 75. He lists, as examples of "teaching acts of the intellectual species":

introducing	proving	vindicating
demonstrating	characterizing	interpreting
citing	justifying	indicating
reporting	explicating	instancing
hypothesizing	defining	questioning
conjecturing	rating	elaborating
confirming	appraising	identifying
contrasting	amplifying	designating
explaining		comparing

<sup>33</sup> Mary Ann Magus, "Brain Asymmetry: The Possible Educational Implications," *1980 Yearbook of the Association for the Education of Teachers in Science* (Ohio State University; ERIC Clearinghouse for Science, Mathematics and Environmental Education, 1979), pp. 104-149.

<sup>34</sup> Orteza, p. 182.

<sup>35</sup> Orteza, p. 178. The quotation is from Philip W. Jackson, *Life in Classrooms* (Not life in the Classrooms as Orteza has it.) (New York: Holt, Rinehart and Winston, Inc., 1968), p. 107. Fellow admirers of this book will be pleased to learn that, in context, the sentence is part of a thoughtful discussion of the problem of attention. Still, one is reminded that this book was written over 14 years ago and may not reflect current practice.

<sup>36</sup> Barak Rosenshine, "Content, Time and Direct Instruction," *Research on Teaching*, ed. Penelope L. Peterson and Herbert J. Walberg (Berkeley, California: McCutchan Publishing Corporation, 1979), pp. 28-56.

<sup>37</sup> Orteza, p. 179.

<sup>38</sup> Ennis, p. 1.

<sup>39</sup> Orteza devotes some attention to analyzing the concept "practice teaching" but this is just a colloquial — or archaic term. Proper terminology is "student teaching" which implies cognitive learning.

<sup>40</sup> C. Owens, "Explaining" Series 2: *Sydney Micro Skills Handbooks* (Sydney: University of Sydney Press, 1975) pp. 12-76.

<sup>41</sup> Bruce Joyce and Marsha Weil, *Models of Teaching* 2nd Edition (Englewood Cliffs, New Jersey, 1980).

<sup>42</sup> Orteza, p. 181.

<sup>43</sup> Douglas A. Roberts, "Theory, Curriculum Development, and the Original Events of Practice," *Seeing Curriculum in a New Light*, ed. Hugh Munby, Graham Orpwood and Thomas Russell (Toronto: OISE Press, 1980). The Schwab papers are: Joseph Schwab, "The practical: A Language for Curriculum," *School Review*, Vol. 78 No. 1. (1969), pp. 1-23; "The practical: Arts of Eclectic.," *School Review*, Vol. 79 No. 4. (1971), pp. 493-542; "The Practical 3: Translation into Curriculum," *School Review*, Vol. 81, No. 4. (1973): pp. 501-22.

<sup>44</sup> For example: Charles W. Fisher and David C. Berliner, "Clinical Inquiry in Research on Classroom Teaching and Learning," *Journal of Teacher Education* Vol. 30, No. 6 (November-December, 1979) pp. 42-48;

Elliott W. Eisner, "On the Difference Between Scientific and Artistic Approaches to Qualitative Research," *Educational Researcher* Vol. 10, No. 4 (April, 1981) pp. 5-9; and Lee J. Cronbach, "Beyond the Two Disciplines of Scientific Psychology," *American Psychologist* (Feb., 1975), pp. 116-127.