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ABSTRACT

This study examined how teachers' curriculum knowledge grows through the process of curriculum analysis and identifies particular areas of growth derived from the experience. The research was conducted with eight individual teachers in Israel. Curriculum analysis is the critical and systematic examination of curriculum materials in order to identify their positive and negative characteristics, potential for teaching and learning, and hidden values and assumptions. Materials-in-use are analyzed to determine strengths or weaknesses to allow for modified implementation. The analysis is guided by an instrument or a scheme which includes questions or criteria to be considered throughout the examination. This instrument is called "SALTAL" and includes 33 prescriptive criteria which explicate the desirable characteristics of good curriculum materials and therefore are normative and judgmental. A description is given of the teachers who participated in the study, the SALTAL instrument, and the way the study was conducted. While substantial growth in curriculum knowledge in the eight teachers was observed, they had difficulty when analyzing familiar materials in detaching themselves from their implementation mode and regarding them objectively. The strengths and weaknesses of the SALTAL instrument are analyzed and recommendations are made for further research. (JD)

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Growth in Teachers' Curriculum Knowledge
through the Process of Curriculum Analysis

by

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Introduction

The numerous reports commissioned recently to study the teaching profession have shared a concern about the past and current quality of teachers' pedagogical knowledge and what is yet to be established in teacher education and continuously developed thereafter (e.g., Task Force on Teaching as a Profession, 1986; Holmes Group Report, 1986; The National Commission for Excellence in Teacher Education, 1985). One important component of the required pedagogical repertoire of teachers is curriculum knowledge which is defined by Shulman and Sykes (1986) as the "understanding of the alternative forms of curriculum for (the teacher's) special area and the ways in which those curricula are embodied in different texts and materials (p.10)." Although the definition is minimalistic, since it limits the curriculum knowledge base to subject matter and its embodiment in materials used for teaching and learning, it is helpful in determining the first stage of curriculum knowledge teachers should acquire and be able to utilize.

At this elementary stage we expect teachers to be wise consumers of curriculum materials and do not expect them to become involved in more complex curriculum decision making, such as curriculum development. These two distinct levels of curriculum literacy suggest a hierarchy of knowledge and skills teachers should acquire so that curriculum would become an important dimension of instruction. The entry level includes components such as, the systematic assessment of curriculum materials in their subjects, selection of curriculum materials, and the adaptation of materials for their specific needs and teaching

environments. The higher level of curriculum literacy requires at least - familiarity with approaches to curriculum development and variables that must be considered in this process.

Research on curriculum literacy is mostly focused upon the second level. For example, Connely and Ben-Peretz (1980) indicate that pre-service and in-service education programs do not prepare teachers to participate in curriculum development decisions and a number of other studies report that such participation holds little or no attraction for teachers (Young, 1979, 1985, 1988).

Research on teachers' basic level of curriculum literacy is sparse and has not been very promising. Silberstein (1982) concludes that instructors of student teachers neglect the opportunity to cultivate choice-making competencies of ready-made curriculum materials. Teacher education institutions tend to omit substantive considerations of curriculum issues programs and this contributes to a tendency among teachers to abdicate responsibility by accepting externally developed specifications (Grant and Melnik, 1978). Ariav and Silberstein (1988) found that specialized curriculum courses in teacher education programs are rare and pedagogical studies do not make the necessary understanding and knowledge accessible to prospective teachers. Summative research on the current state of teacher education and alternate models for the preparation of teachers focus on pedagogical studies only in very general terms and does not elaborate on their various components, such as the curriculum element (Cruickshank, 1985; Lanier and Little, 1986).

These studies point out that despite the importance of curriculum knowledge in a teacher's education, prospective teachers do not enjoy the study of curriculum in their programs. Although curriculum literacy and critical curriculum competencies are viewed as the hallmark of initial teacher training (Ruddock, 1984) they can be extended and developed in in-service programs as well. However, except for studies on school-based curriculum development, research on curriculum literacy in in-service training is almost non-existent.

Although the need for curriculum knowledge increases as demands for more autonomous, critical and reflective teachers grows (Ben-Peretz, 1984) only a few approaches have been developed to inquire specifically how curriculum knowledge could be established as a part of a teacher's pedagogical repertoire. Silberstein and Tamir (1986) describe a series of modules developed for teacher training in curriculum studies in Israel and report a preliminary positive response by teacher trainers to include some of the modules in their courses. So far, little is known about the actual use of these modules as well as similar materials developed in England, Australia and the U.S.A. Goodman (1986) describes a critical approach to curriculum design that has been taught to pre-service teachers and which enhanced their sense of autonomy and creativity and helped them begin to understand the link between theory and practice. These studies describe possible ways of engaging groups of prospective or practicing teachers in curricular deliberations. They do not focus specifically on the kind and quality of change in teachers' curriculum knowledge associated with their approach. While the value of group work is unquestionable, it camouflages

the particular thinking mode and attitudes of each individual in the group. The research considered in this study uses a different approach. This research was conducted with individual teachers in Israel to examine the nature of growth in teachers' curriculum knowledge through a different approach — curriculum analysis.

Curriculum analysis is the critical and systematic examination of curriculum materials in order to identify their positive and negative characteristics, potential for teaching and learning, and hidden values and assumptions (Ariav, 1986). Very often this examination is executed for the purpose of selection prior to their use in the classroom. When materials-in-use are analyzed the purpose is to determine strengths or weaknesses to allow for modified implementation. The analysis is guided by an instrument or a scheme which includes questions or criteria to be considered throughout the examination. There are currently almost fifty such instruments, which represent a wide spectrum of ideologies and approaches in the curriculum field (Ariav, 1983).

Instruments for the analysis of curriculum materials are strongly related to the first level of curriculum knowledge although they can also be applied in a proactive fashion to higher levels of curriculum decision making. A few studies used such analysis instruments in pre-service and in-service training but their interest was in the validation or practicality of the instruments (Eraut et al., 1975; Ben-Peretz, 1977; Ariav, 1983). Data about the impact of these instruments on the teachers' curriculum knowledge were incidental, not well documented, and in general

about whole groups. This paper used an instrument for curriculum analysis to examine how growth in teachers' curriculum knowledge occurs. To achieve an in-depth inquiry we worked with eight individual practicing teachers rather than with a group and followed them closely to assess the growth process.

Description of the Study

The major purpose of the study was to examine how teachers' curriculum knowledge grows through the process of curriculum analysis and to identify particular areas of growth derived from the experience. This goal was not directly stated to the participating teachers at the outset because we did not want to influence their thinking and attitudes. The researchers presented the goal of the study as the pilot testing of a new instrument for curriculum analysis. We indeed received many reactions about the instrument itself which helped us improve it, but our focus was on the process related to the instrument and the corresponding changes in perception as well as behavior as a result of their encounter with the instrument.

The Course of Study

The researchers, individually or in pairs, worked intensively with each of the eight Israeli teachers during a period of two to three weeks. The work with every teacher differed in schedule and duration of time but followed the same sequence:

- a. A recruitment effort, where the researchers approached the teacher, asking him or her to take part in the study. In most cases, the instrument was shown to the teacher and a general description of the next steps in the process was provided. Teachers who did not indicate interest or felt that due to pressure and overload could not devote the time required for participation were not included in the study. Out of eleven recruitment efforts only eight were successful at this stage, and they varied largely in levels of enthusiasm, interest and motivation.
- b. An exchange in which the teacher received a copy of the instrument and gave the researcher a copy of the curriculum materials he or she decided to analyze with the instrument. At the same time that the teacher was supposed to read the instrument for the next meeting, the researcher was expected to examine the curriculum materials carefully.
- c. A two to three hour working session, in the school or the teacher's home, where the teacher and the researcher analyzed the curriculum material together, using the instrument for curriculum analysis. The purpose of the researcher's participation in this first application was to help the teacher understand the instrument and the ways in which it can be used.
- d. An individual application of the instrument to other curriculum materials done by the teacher without the presence of the researcher.
- e. A semi-structured interview of the teacher by the researcher about the instrument and the process described in (a) - (d) above.

All meetings were tape-recorded and transcribed. The researchers also used their field notes and the written analyses of curriculum materials by

the teachers. The data were content analyzed according to the interview questions by at least two researchers independently. The two analyses of each case were then compared and only negligible differences were identified in some of them. Since no major discrepancy emerged in the comparisons we can attest to the reliability of the data analysis.

Data were aggregated from the eight case studies to allow for comparison and the indication of similarities and differences. All quotations were translated from Hebrew to keep the meaning intact.

The Teachers

Table 1 describes the major characteristics of the teachers who participated in the study. The teachers represent a large variety of educational roles and they teach many different subjects. They are experienced (average teaching seniority is 15.5 years) and middle aged (the average age being 43). Most of them rely heavily on materials produced or approved by the Office of Education of the Israeli government. We were curious to learn whether these eight very different teachers would share any common thoughts, feelings and behavior regarding curriculum and instruction throughout and at the end of the curriculum analysis experience.

The Instrument

The instrument for curriculum analysis used in this study is called SALTAL. (The instrument is currently under revision and can be requested

Male/Female	Age	Education	Educational Role	Seniority	Materials - analyzed
F	30-40	B.A.	Middle school teacher, Bible & literature	8	externally produced
M	40-50	B.A.	Elementary school principal; Teacher, history & math	18	externally produced
F	20-30	B.A. & M.A. student in C &	Special ed. teacher in a special education school	5	externally produced, self adapted materials
F	40-50	B.A.	H.S. reading specialist working with disadvantaged students (literature, Bible, reading comprehension, rehabilitative reading)	8	externally produced, self developed materials
M	40-50	B.A.	H.S. teacher, math and statistics	25	externally produced
M	50-60	M.A.	H.S. teacher, Bible; Teacher training College, Bible teaching	27	externally developed; self developed materials; materials developed in college
F	50-60	B.A.	Teacher training college, Instructor, art for early childhood	20	self developed materials
F	40-50	B.A. & M.A.	H.S. teacher, social studies; Member of a committee for curriculum development in social studies of the Department of Education	13	externally developed, self developed materials

Table 1. Characteristics of the teachers.

from the author directly.) It was designed by a team of curriculum experts during a long and arduous process of deliberations which followed a thorough examination of a variety of other existing schemes for curriculum analysis.

SALTAL includes 33 prescriptive criteria divided into five major categories. An example of a criterion from each of the categories is illustrated in Table 2. The criteria explicate the desirable characteristics of good curriculum materials and are therefore normative and judgmental. Prior to the list of criteria there is a general introduction which explains how the instrument was developed to the user, what its philosophical underpinnings are and how it should be applied. Following the list of criteria is the working sheet for the user, in which the criteria appear in a concise version, each with a rating scale attached to it. The combined points on the 33 scales provide the analyst with a graph that is a visual representation of the analysis of the material under examination.

Category	Criterion
1. rationale and objectives	the material allows for additional objectives to be derived beyond the stated objectives
2. content	the content of the material represents basic principles and central ideas of the subject matter
3. structure and organization	the material allows for flexible adaptation to suit the students' needs
4. instructional modes	the material encourages the student to participate actively in the learning process
5. thinking and experience	the material allows the student to engage in meaningful and practical problem solving

Table 2. Examples of criteria from SALTAL

FINDINGS

The findings presented here are organized around two headings:

- (1) changes in attitudes, behavior and knowledge that reflect growth in curriculum knowledge; and
- (2) practical utility of the curriculum analysis process for increasing teachers' curriculum knowledge.

(1) Changes in attitudes, behavior and knowledge throughout the study

Three major stages have emerged throughout the process, corresponding mainly to (a)-(b), (c)-(d) and (e) on pages 5-6. The entrance stage was often characterized by different levels of anxiety, hesitancy, tension or

reluctance. In the opening stage the participating teachers displayed relief accompanied by a willingness to admit their lack of understanding of SALTAL and to express reservations and questions about it and then an eagerness to proceed with the work. Finally, the reflection stage encouraged most of them to inquire into their own educational practices in making curriculum decisions and elicited many recommendations on how to improve SALTAL. This interesting transformation from passivity and concern to reflection and action is documented below.

At the entrance stage the teachers felt threatened; they perceived their established practice to be in jeopardy. The teachers felt that SALTAL questioned their ability and accumulated teaching wisdom when making curriculum decisions and did not give credence to their professional expertise. One teacher explained: "The use of an instrument is superfluous because good teachers can automatically see all the bad and good things in teachers' materials, evaluate them and decide whether or not they're suitable. For veteran teachers, it's a 'put-down' because their experience has taught them what is good and not good." However, when this veteran teacher was asked what criteria he would consider in an evaluation, his answer included only few characteristics: "the content, the questions, the level of the material, if it is appropriate for the students, if it includes what the student needs for the matriculation exam and his future life."

Teachers who found themselves in need of an instrument which would help them evaluate curriculum materials and recommend which ones to select

for the next school year were more motivated in the beginning than those who did not have an immediate agenda for application.

The three teachers with graduate course work were a bit more assured of themselves in the beginning perhaps because of their familiarity with some of the professional terminology in SALTAL. The early childhood art teacher stated: "I have a negative reaction to working with analytic instruments...I've had bad experiences in the past...instruments make me nervous and uncomfortable; somehow I do not think in structured schemes." The attitude of mixed curiosity and anxiety was reflected in the relative speed with which the majority of the teachers read SALTAL the first time and their conviction that they understood it well. Except for one teacher who read it carefully and came prepared with questions about it to the first working session, all other teachers said it took them only ten to fifteen minutes to read the seven page document and understand it. Since SALTAL is by no means an easy instrument and scanning it would be of no worth to any user, this phenomenon seems to suggest that anxiety or frustration was indeed high among the participants.

Once the teachers started to engage in the actual application of SALTAL, they entered the opening stage. By discussing it, arguing about it with the researcher, struggling with the meaning of the criteria, and examining materials against these criteria, both attitude and behavior changed. This was the breakthrough. Relief replaced anxiety and the total acceptance of SALTAL turned into explicit admission of the initial

misunderstanding of much of what it says. The teacher-researcher dialogue in the working session facilitated much of this change. The teachers' independent applications of SALTAL, which followed the working session, played a major role in helping the teachers come to grips with the instrument and appreciate its significance on both a general and personal level.

Some of the teachers said they did not understand the curricular meaning of terms such as: "autonomous teacher," "active learning," "emotional readiness," "biases," and "social relevance." Others resented the assumed responsibility that SALTAL assigns to teachers; as one of them said: "Is the teacher expected to know all stages of the learner's cognitive, emotional and social development? Should he know this for every student? This isn't realistic."

Most of the teachers had difficulties in understanding the criteria related to the structure of the discipline. One teacher claimed: "Principles of the discipline are not objective, they depend on one's world view: Is literature the teaching of values, or art?" Two teachers said that language arts subjects cannot be scientifically updated and most of them thought that particular criteria are not applicable to their subject. For example, the math teacher claimed that all the affective criteria are meaningless in mathematics because "what moral and educational approaches can be dealt with through logarithmic equations?" The special education teacher said that "the whole content category (in SALTAL) is irrelevant for special education because in special education

we emphasize process, competencies and skills and the content is marginal, it is only a vehicle." The reading specialist did not think that the criteria under the "thinking and experience" category were important at all in her teaching. Such statements about SALTAL reveal to the researchers teachers' thinking about their professional world in general and their curriculum understanding in particular. We were certainly concerned to hear that "tying past experiences with present experiences is an important criterion for the study of sociology but not of economics" and that "curriculum materials which encourage the teacher to act autonomously is a theoretical criterion with no practical value."

Such comments and remarks demonstrate a very narrow and low level of curriculum knowledge by practicing teachers. Although the comments and questions indicated educational ignorance, they served an important function in opening up an explicit discussion about what curriculum is all about. It took a lot of courage to make such statements, especially when the partner in the dialogue was a so called curriculum expert. This courage obviously helped them to move into the last stage which was established through the interview.

The interview enabled the participating teachers to reflect retrospectively upon the whole process and at the same time extend this process further into a different experience. This was the reflection stage. Basically, the teachers came to their last meeting with an intention to discuss the work they had done with the individual applications. This, however, seemed to all of them as an exercise from

which they should draw conclusions and take some actions. At this stage many of them took the initiative and restructured SALTAL in a way that would be more useful to them. Six teachers said that in the future they will use the instrument as is or in parts and will share it with other teachers in the school. While one teacher said that she would never use it voluntarily, another said: "What is interesting is how the instrument you offered me can help me structure my own instrument, built on this one, but one that will be mine. What a person develops for himself, even if it draws on other sources, is his and means something completely different to him. The instrument must be "owned" by an individual, like everything else.

In this active stage the teachers took the liberty of criticizing the language of SALTAL, its structure, its educational assumptions, and the applicability of the criteria. Their suggestions ranged from eliminating to adding criteria, from combining to separating related criteria, and from changing the focus of the introductory section of SALTAL to modifying the rating scales. Through these recommendations they exhibited a much more articulated understanding of curriculum issues.

Although a substantial growth in curriculum knowledge was observed, a few obstacles remained and due to lack of time were not handled in this study. One of them was the constant difficulty the teachers had when analyzing familiar materials to detach themselves from their own implementation mode of these materials and regard them as self contained entities. Another difficulty was the confusion between criteria which were not relevant in a

(the latter is considered negative according to SALTAL). Some of the teachers were concerned that the instrument might not support their initial intuitive judgment of the materials and invested energy in defending their intuitive decision with the analytic tool even though the result of the analysis clearly indicated weaknesses. One teacher did not understand until the end of the study that materials and content are not synonymous terms or why SALTAL is a judgmental instrument. But on the whole, the differences between the beginning and the final stages of the study in terms of attitudes, behaviors and knowledge were significant.

(2) Practical utility of the curriculum analysis process for increasing teachers' curriculum knowledge.

The focus here is not on changes over time and the stages of growth in the teachers' curriculum knowledge, but rather on the total effect of the experience. All the teachers, unanimously, felt that the process of curriculum analysis was worthwhile and important because it forced them (1) to deliberately consider a variety of curricular dimensions and (2) to justify their curriculum decisions. Evaluative remarks included the following:

- "The instrument guides toward the examination of curricula, it provides a strong structure for the examination and forces one to explain why."
- "SALTAL is idealistic; it is also comprehensive and helps expose what exists in the materials and defines it...it provides a basic evaluation and allows one to make a grounded selection."
- "As a science person I recognize the importance of an instrument whose approach is a logical analysis, with categories and criteria, which enables me to examine curricula from all sides.... It is hard to

conceive of a curriculum that will indeed include all these positive and desirable points... If we will focus on all of these points we will be able to create a curriculum which is almost perfect. In other words, I maintain that the instrument is good for curriculum development...but it could even be helpful on a daily basis for preparing lesson plans."

- "The instrument attacks the materials from all directions, it forces the teacher to check the materials in depth and seriously.... Because of the criteria it is easy to identify what is missing in the curriculum. For example, in my analysis I discovered that the curriculum materials provide no suggestions for evaluation of the learning process."
- "SALTAL clarified for me that the curriculum I use is better than I thought it was... I find the instrument important especially for special education, where everyone chooses materials indiscriminantly, with no criticism."
- "A logical organization of the analytic process calls for a complete and comprehensive analysis.... SALTAL is not a simple tool, it requires thoughtful reading...it allows one to see many points of view. In addition, many of these were new to me... it surely makes one examine the curriculum carefully."
- "SALTAL enables me to recognize the weaknesses and strengths of the materials. Through SALTAL I learned about the potential of the curriculum. By potential I mean what exists in it implicitly and in a hidden way. I was not aware of these overt and hidden facets before."

The last citation is from a teacher who initially had a strong objection to "quantifying and computerizing issues in language arts curricula" and claimed that "when you brought the instrument and explained it, that was already a drawback. It means that SALTAL is not clear enough...and then it is not a helpful tool for me." Yet, at the end he said: "Throughout the work many concepts and the whole essence of SALTAL, its goals...became clear as well." It is evident therefore that even when SALTAL was criticized as a tool, the idea of and need for curriculum analysis was internalized, implying a certain growth in awareness and knowledge of curriculum issues.

The teachers who participated in this study did increase their curriculum

knowledge as evidenced from their statements above. The growth, though, was the result of a slow and at times uneasy process which followed a three-stage pattern of change. The explanations and implications of these findings are discussed below.

DISCUSSION

The eight teachers in this study, although experienced and mature, did not demonstrate a thoughtful and careful understanding of the curricular dimension of their work. In a way, their pedagogical knowledge was lacking since they appeared to be "curriculum illiterate." However, the process designed to introduce them to a systematic and deliberate analysis of curricula contributed to their awareness and understanding of the multiplicity of curricular dimensions in their teaching. It facilitated a higher level of sophistication in making curricular and instructional judgments and thereby added some theoretical (and maybe even intellectual) strength to their professional life.

Shavelson's (1987) research on teachers' judgment of persons or objects calls for additional studies on teachers' judgmental processes to serve as a basis for training teachers to improve their ability to go beyond available information and to become more aware of the nature of their critical judgment. It was evident in this study that in the initial stage all the teachers relied strongly on intuition when evaluating curriculum materials and making selection, adaptation or development decisions. Their criteria for assessing the worth of curricula were in most cases

hidden and the teachers had difficulty in articulating them. When one of the teachers did mention a few of the criteria they were dull, vague, and superficial. What does it mean, for instance, to consider "the questions" while evaluating materials? Did he mean levels of questions, types of questions, number of questions, variety of questions, etc.? While teachers should be proud of their intuitive judgment, which probably draws on heuristics, it is not sufficient for making professionally sound decisions.

The quick reading by teachers of SALTAL at the initial stage of study, combined with an expressed high level of anxiety and frustration, seems to indicate that the experience was perceived by the teachers as threatening. Threat reflects insecurity, uncertainty and inadequate competence with which to handle a situation. Why did teachers with 5 to 27 years of teaching experience and interest in the study have such an initial reaction to the instrument? It is obvious that some of them perceived the analytic nature of SALTAL as being in direct and unequivocal opposition to their impulsive and spontaneous decision making process. If analysis and critical thinking are complementary modes to intuition (rather than in contrast to one another) it seems important to strengthen teachers' judgmental skills and increase their awareness to the desirability of balancing intuition against thoughtful analysis. This combination would increase the chance of making more deliberate and justified curriculum decisions.

The major importance of combining intuitive and analytic thinking in

making curricular decisions lies however, in the democratic assumptions which undergird the teaching profession (Dewey, 1916). Teachers who are not critical and are not accountable for their judgments transmit dogmatic thinking to their students which prevents open, challenging and questioning of current practices and norms. The curriculum analysis process forced them to question the grounds for making certain pedagogical decisions. It helped them realize the value of applying systematic means, conceptual frameworks, and thought provoking approaches in their instructional decision making.

The analytic tool was the impetus for the change process which led to substantial growth in the teachers' curriculum knowledge. The change was more meaningful to those who had a perceived need for a curriculum analysis tool, but it generally followed a three-step sequence which resembles Lewin's (1947) model for system change. The distinct stages in the change process which emerged from all eight cases suggest that: (a) an initial dissonance is indeed required to trigger questioning of actions and principles which are generally taken for granted; (b) a series of concrete experiences accompanied by dialogue and expert-support is crucial for the establishment of readiness and openness to a new idea; and (c) an opportunity for reflection and self-examination is very important for internalizing some aspects of the experience. This implies that a brief in-service on curriculum analysis will not result in a significant change and that the accumulative nature of the experience is a necessary condition for creating growth. Teachers need an opportunity to reflect

upon experience, and for this they need both the time and the tools (Jackson, 1971).

SALTAL, as an instrument for curriculum analysis, proved to be an effective tool in enhancing the teachers' understanding of curricular considerations in their practices. This tool differs from other schemes for curriculum analysis in the way it was designed and the unique characteristics it offered to the users. The vast number of comments and suggestions that the teachers proposed about SALTAL will eventually lead to an improved version of the instrument. However, its important contribution to this study was in playing a central role in the process by averting the participants' anxieties from themselves to an external object. In the beginning of the process, and even in the second stage of the study, it seemed easier to attack the instrument than accuse oneself for shallow understanding; it was more convenient to clarify the criteria in it than to admit not understanding them; and it was more feasible to start with something concrete and extend the discussion to conceptual and theoretical discussion than to engage in abstract and aloof dialogue about the desirable characteristics of curricula.

SALTAL is the only instrument known to us which has been used with individual teachers over an extensive period of time in order to engage them in curriculum analysis. It helped reveal biases, conventions and superficialities in teachers' curricular thinking in a way not yet researched. It helped identify how subject matter influences teachers' beliefs of what is important or relevant in their teaching. (One good

example is the math teacher who views his teaching as purely cognitive, failing to understand the moral implications of his work.) It also demonstrated clearly that much of what we assume to be conventional wisdom of teachers is in fact absent or partial. The majority of teachers in this study had no familiarity with curriculum language (e.g., terminology, concepts), curriculum practices (e.g., where to look for what while evaluating materials, how to compare similar materials, what the inter-relationships are between curriculum and instruction), and curriculum theory (e.g., approaches and their epistemological underpinnings, ideas and their history). Because proper application of SALTAL required familiarity with curriculum language, practices, and theory, SALTAL was instrumental in creating a substantial growth from a "non-use" level to a "refinement" level on the continuum of "levels of use" described by Hall et al. (1975).

It is disturbing to witness the lack of basic knowledge of curricular aspects in the work of experienced and mature teachers, some of whom are principals and teacher trainers. The fact that five out these eight teachers develop their own materials is more than troubling. How can one engage in curriculum development or participate in a national committee for curriculum development in social studies without being "curriculum literate?" These teachers probably tell themselves uncsciously what is important, but as stated earlier, this does not involve deliberate and articulated thought; the decisions are made at a "gut-level". When the first level of curriculum literacy is missing, higher, more advanced levels cannot be reached.

The researchers, as facilitators, assisted the teachers in slowly developing a better sense of curricular considerations and trust in their ability to apply SALTAL. The one-to-one work, which was based on constant dialogue, shared deliberations, and mutual study, made an important contribution toward assessing the growth of curriculum knowledge.

The eight cases in this study allowed for a close examination of the growth process. Growth was evident in the final comments made by the teachers in the interview, their illuminating suggestions about the modification of SALTAL, their relaxed attitude the tool at the end of the process, their confidence in applying SALTAL skillfully after using it a few times, and their satisfaction of having exposed the strengths and weaknesses of their curriculum materials.

It is difficult to assess how much of the growth is attributed to the instrument itself and how much is due to the "instruction" process used in this study. Clearly, SALTAL had a unique contribution because its content and structure are provocative yet rhetorical. On the other hand, all eight teachers claimed that without the training and reflection sessions they could not have used SALTAL properly, with insight and understanding. Two teachers recommended extending the teacher-researcher work and allowing for additional experiences and communication. One teacher said: "An average teacher, without the required background (curriculum analysis) will not be able to face the instrument... Without your guidance -- a structured, professional and thorough guidance -- I would probably not have arrived at a meaningful analysis." It seemed to all of the

participants that merely reading the instrument or applying it without the deliberative process would be useless. Hence, the important contribution of the sequenced process to the identified effects in the study.

CONCLUSION

This study has detailed a curriculum analysis approach to enhancing teachers' curriculum knowledge with practicing teachers. It shows that the process of curriculum analysis leads to a significant growth in curriculum knowledge for practicing teachers. By the end of the experience the participating teachers were not yet "curriculum literate" but they did begin to become sensitive to their ability to critically examine curriculum materials and develop professional autonomy in curriculum decisions. Clearly, it is important to research the ways in which these teachers have used their newly acquired knowledge in their classroom work. We need to understand how the curriculum analysis experience is translated in such curriculum decisions as selection, adaptation, and development. We need to find out the extent to which they are committed to SALTAL (or a version of the instrument) and how regularly they use it. Another question worth exploring is the participants' interest in pursuing further their studies in curriculum through in-service training or formal studies toward a degree. Finally, it seems important to develop alternate approaches to extend teachers' curriculum knowledge and compare their effectiveness. To gain insight into these and other questions longitudinal research and comparative studies are needed.

This study focused on individual teachers in order to examine carefully

whether growth occurs, how exactly it happens and how it is manifested. Now that we know more about the process and how it works it can be expanded to small groups of teachers working with a curriculum expert. In fact, three teachers suggested that an optimal process should include groups of teachers to enrich the discourse and allow for different reactions and points of view. In planning an effective curriculum analysis process as a means of creating a better understanding of the curricular dimension of teaching, we need to consider these two aspects: the characteristics of the analysis instrument and the nature of the training (i.e. pace, intensity, length and group size). More research is needed to help determine the desired character of each aspect as well as their inter-relationships.

This research describes a process which was difficult for practicing teachers. This does not necessarily imply that the process would be harder for student teachers. It is possible that prospective teachers who have not yet developed established routines for instruction would indeed experience less difficulty with such a process. Although it seems ambitious to expect student teachers to fully engage in this process, it is clearly unreasonable to wait for teachers to be in the field for a number of years before acquainting them with curricular issues in a systematic and thoughtful manner. Even though student teachers often lack the necessary perspective required for an informed curriculum analysis process we might find a way to make it meaningful to them before they enter teaching. It is important to research the optimal stage in a

teacher's professional development for the introduction of curriculum analysis (or another effective process) in order to create a thorough curriculum knowledge base.

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